





COMMITTEE ON INDUSTRY AND TRADE

Further  
Factors in Industrial  
and  
Commercial Efficiency

Being Part II of a Survey of Industries

WITH AN INTRODUCTION BY THE COMMITTEE

9501

LONDON:

PRINTED AND PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE  
To be purchased directly from H M STATIONERY OFFICE at the following addresses  
Adastral House, Kingsway, London, W C 2, 120, George Street, Edinburgh,  
York Street, Manchester, 1, St Andrew's Crescent, Cardiff,  
15, Donegall Square West, Belfast,  
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1928

Price 3s. 6d. Net.

## COMMITTEE ON INDUSTRY AND TRADE.

## INSTRUMENT OF APPOINTMENT.

Whereas it has been represented to me, the Right Honourable James Ramsay MacDonald, Prime Minister, First Lord of the Treasury and Secretary of State for Foreign Affairs, by the President of the Board of Trade, that it is desirable to inquire into the conditions and prospects of British industry and commerce, with special reference to the export Trade;

Now I, therefore, do hereby appoint the following persons\* to form a Committee to inquire into and report upon the aforesaid matters, and to make recommendations in regard thereto;

Sir ARTHUR BALFOUR, K.B.E. (*Chairman*).  
 Mr. JOHN BAKER.  
 Sir WILLIAM BEVERIDGE, K.C.B.  
 Mr. HENRY BOOTHMAN.  
 Mr. J. T. BROWNLIE, C.B.E.  
 Mr. W. T. CHARTER.  
 Mr. C. T. CRAMP.  
 Mr. HUGH DALTON, D.Sc.  
 Sir HARRY GOSCHEN, K.B.E  
 Mrs. M. A. HAMILTON.  
 Mr. F. A. HARGREAVES.  
 Sir NORMAN HILL, Bart.  
 Sir JOHN S. HINDLEY.  
 Mr. DAVID LANDALE.  
 Sir W. CLARE LEES, O.B.E.  
 Mr. P. J. PYBUS, C.B.E.  
 Mr. ARTHUR SHAW.  
 Sir ALLAN SMITH, K.B.E.  
 Sir HUBERT LLEWELLYN SMITH, G.C.B.

I further appoint Mr. W. Carter to be Secretary and Mr. A. R. Fraser and Mr. W. L. Buxton to be Assistant Secretaries to the said Committee.

(Signed) J. RAMSAY MACDONALD.

28th July, 1924.

\* The members whose names are marked with an asterisk subsequently found it necessary to resign, and the following additional members were appointed:—

Sir WILLIAM ASHLEY, Ph.D. (appointed 2nd December, 1924, died 23rd July, 1927).

Sir W. PETER RYLANDS (appointed 30th April, 1925).

## MEMORANDUM ACCOMPANYING TERMS OF REFERENCE.

The scope of the terms of reference is regarded as being on the general lines set out in the three following paragraphs, which are intended as explanatory of the subjects on which investigation is specially desired and not as an exhaustive definition of the inquiry:—

“ The first question to which the attention of the Committee should be directed is the present position of British overseas trade and the prospect of British participation in the markets of the world being such as to ensure sufficient and continuous employment and a satisfactory standard of living in this country. The examination of tendencies and developments in the markets of the world and also in the chief competing countries will be involved, together with an inquiry into the growth of competition with British goods in these markets, the likelihood of its continuance, and its probable consequences.

“ The second question is the ability of British industry to meet competition under the conditions thus determined and to adapt itself to changes in the nature of overseas demand. This involves an inquiry into British productive capacity and organisation, including the supply and efficiency of capital, labour and management, the present and future adequacy of raw materials and possible improvements in their utilisation, and the part played by the United Kingdom in new developments of industry, particularly those which are the outcome of scientific research. Matters to which attention might be directed are the present extent of large-scale production, its possibilities and limitations; the efficiency of plant and equipment; power supply and transport as factors in cost of production; marketing organisation at home and abroad; and the current methods of industrial and commercial finance. It will be necessary, in addition, to take account of the effect of State regulative action upon costs and output.

“ The third question is that of the relations between those engaged in production. This will involve inquiry into methods of industrial remuneration, the main causes of unrest and disputes, and the methods of avoidance or settlement of disputes, as, for example, co-partnership, co-operation, Wages Boards and voluntary arbitration, State regulation of wages, and compulsory arbitration and compulsory enforcement and extension of agreements.”

New Public Offices,  
Great George Street, S.W.1

The Rt. Hon. Stanley Baldwin, M.P.,

January, 1928.

Sir,

We, the Committee appointed by your predecessor on the 28th July, 1924, "to inquire into and report upon the conditions and prospects of British industry and commerce" addressed a letter to you in June, 1925, transmitting a collection of Surveys of Overseas Markets, and stating that we proposed to submit from time to time, in advance of our final report, further collections of material bearing on different aspects of our reference. In pursuance of this proposal, we submitted to you in February, 1926, our Survey of Industrial Relations, and in December of the same year our third volume entitled "Factors in Industrial and Commercial Efficiency."

In forwarding the last mentioned volume we explained that it constituted the first part of a Survey of Industries, the material for which was too extensive for inclusion in a single volume. This Survey we have now completed, and we beg to submit it herewith, to be laid before Parliament if so desired. The three parts into which for the sake of convenience it has been divided, form, with the preceding volume, a connected whole. In order to facilitate the study of this final collection of memoranda, we have prefixed to it a brief introductory summary and review.

We venture to hope that the six volumes which we have now completed will not only be found of practical utility in relation to the problems of the present time but will also prove of permanent value as a record for future reference.

The preparation of our Final Report has already been begun and we now propose to press on with its completion.

Since we last addressed you, we have suffered a grievous loss through the death of our valued colleague Sir William Ashley, and we wish to take this opportunity of paying our tribute to his memory.

A. BALFOUR (*Chairman*).

JOHN BAKER.

HENRY BOOTHMAN.

J. T. BROWNLIE.

W. T. CHARTER.

C. T. CRAMP.

W. H. N. GOSCHEN.

MARY AGNES HAMILTON.

F. A. HARGREAVES.

NORMAN HILL.

JOHN S. HINDLEY.

DAVID LANDALE.

W. CLARE LEES.

W. PETER RYLANDS.

ARTHUR SHAW.

ALLAN M. SMITH.

H. LLEWELLYN SMITH.

W. CARTER, *Secretary*.

A. R. FRASER } *Assistant*

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## INTRODUCTION.

The third volume issued by the Committee on Industry and Trade dealt with certain common factors affecting industrial and commercial efficiency, as an introduction to a series of detailed surveys of certain groups of exporting trades. This, the fourth Volume, together with the forthcoming fifth and sixth Volumes, continue and complete the survey of industries. Though divided for convenience into parts, these volumes form a connected whole ; and the present introduction applies to all the three volumes. Of the contents of the volumes by far the larger part consists of detailed surveys of certain great groups of trades—textile (cotton, wool and artificial silk), iron and steel, engineering, electrical manufacturing, shipbuilding, and coal. The remainder of the contents consists of a number of Memoranda, in continuation of those contained in the third volume, analysing certain factors in industrial and commercial efficiency which are more suitably dealt with together. Among the subjects so treated is the growth of industrial output and power capacity, on which much new light (albeit still partial) has been thrown since the date of our last volume through the publication of a number of provisional results of the recent Census of Production. Other Memoranda analyse the information received by the Committee on the vitally important question of costs of production and distribution, while others deal with changes in the industrial and geographical grouping of the population, the transport facilities which they enjoy and the situation as regards overseas migration of skilled tradesmen. Others deal with a number of problems all having a direct bearing on industrial efficiency, e.g. over-capitalisation, industrial fluctuations, public trading enterprise, and the supply of official information and statistics. These Memoranda occupy the whole of the present volume. The two forthcoming volumes (our fifth and sixth) are taken up with the industrial surveys. These surveys are based not only on official data, but also (and, generally speaking, to a preponderant extent) on information supplied by the trades themselves, either by way of oral and documentary evidence furnished to the Committee, or in response to special inquiries addressed to them or in the form of published reports and memoranda. In addition the results of several other official and unofficial inquiries have been freely drawn upon for material. In two cases (coal and shipbuilding) the information derived from the industries themselves is mostly indirect, since both these industries have recently been the subjects of detailed surveys, the former by a Royal Commission, the latter by a joint trade inquiry, the results of which have been accepted in lieu of direct evidence. In respect of all the other groups information has been obtained from all the different sources enumerated above.

As a result it may be claimed without hesitation that for the most part the accounts given in the present volumes of the conditions prevailing in certain great groups of exporting trades are the most comprehensive statements on the subject that have been brought together in recent times. From these surveys it is possible to obtain a clear picture of the historical conditions under which each of these great industries has grown up ; the development of its main branches, as measured by numbers employed, volume and value of production and growth of overseas trade ; the structure and organisation of the industry ; its situation with regard to such special problems as supply of raw materials, the development of scientific research, standardisation, selling organisations, international agreements, etc. ; and its whole position in relation to foreign competition whether in overseas markets or at home. These surveys of the growth, present conditions, and prospects of each of the groups of exporting trades are absolutely essential to a just appreciation of the position and tendencies of British trade and industry as a whole, and the assembly of the surveys in the present volumes will facilitate the study of each industry's problems in the light of those faced (and it may be surmounted) by others. Lengthy as some of them are, they are the result of sifting and summarising an immense mass of material, and they do not lend themselves to further compression, or to epitomising in a general introduction. In some of the Memoranda already referred to, which deal with certain factors of common interest affecting industrial efficiency, use has been made (*inter alia*) of data contained in the surveys of industries. Apart from this no attempt has been made to summarise the surveys, which are left to tell their own tale in their own way ; and, in accordance with the settled policy of these volumes, the Committee have deliberately refrained from formulating conclusions or making recommendations as to the conduct of particular industries, or the relation of one to another—a part of their duty which belongs to and is reserved for their final Report.

The question may be asked how far surveys of selected exporting trades can be regarded as accurately representing the whole trend of British trade and industry

It will be remembered that the group of great exporting industries was chosen for special examination by the Committee at a very early stage of the inquiry in order to limit the otherwise limitless field of investigation, and to concentrate attention on the industries which play the most important part in British export trade—a matter to which the special attention of the Committee was expressly directed in their terms of reference. This group of trades accounted, both before and since the war, for about two-thirds of the total exports from this country and for at least three-quarters of the exports of manufactured goods and coal. The policy of the Committee has been amply justified as a provisional working rule,

inasmuch as undue dissipation of effort has been avoided, and the immense range of problems included in the terms of reference has been reduced to something like manageable proportions. But while the industries within the chosen sample account for the bulk of British export trade it does not necessarily follow that their recent course of development has been fully representative of the trend of British industry as a whole. On the contrary it is *prima facie* not unlikely that the industries which have been the great staple export trades of the past may in some cases have failed to keep step with the recent growth and progress of some of the newer though smaller trades.

Among the great exporting industries are included certain branches of export which, thanks to the earlier industrial development of this country, enjoyed at one time something approaching a monopoly in overseas markets—a condition which in recent years has passed away and given place to increasing foreign competition. It would therefore not be surprising if certain of the trades which for many years have furnished the bulk of British exports showed a lower rate of progress than some of the newer industries that are growing up alongside of them.

There is also a further question, viz. whether a series of surveys of individual industries, however complete and accurate in themselves, can in the aggregate convey an adequate picture of the situation and trend of British industry as a whole, seeing that this situation and trend are determined not only by the internal conditions prevailing within the separate industries but also by their mutual relations and reactions, as well as by common factors which are beyond the power of any single industry to modify. Neither of these questions can be answered until we have passed in review the available information as to output, costs and other factors in industrial efficiency.

### Industrial Output and Power.

Since the publication of our last volume\* new light has been thrown on the industrial situation in Great Britain by the issue of some of the preliminary results of the Census of Production of 1924—the first comprehensive statistical survey of British industry that has been made since the war. Such results as were published in time have been utilised in the preparation of our “Survey of Textile Industries” and our “Survey of Metal Industries.” There are, however, certain conclusions of a more general kind which may be provisionally drawn from the figures, partial though they are, which have so far been issued. On page 46 will be found an analysis and summary of certain of the published data, rearranged according to groups of trades so as to show at a glance the change which has taken place between 1907 (the date of the first Census) and

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\* “Factors in Industrial and Commercial Efficiency.”

1924 as regards numbers employed, power capacity, and net output. In some cases the corresponding figures for 1912 can also be stated, but it will be remembered that the completion of the Census for that year was prevented by the outbreak of war. Thus, while a detailed comparison can be made between 1924 and 1907, we have only sufficient material with regard to 1912 to enable a very rough estimate to be made of the comparative situation just before the war.

The methods adopted to arrive at the comparative tables referred to are described in the Memorandum itself and need not be repeated here. Subject to the qualifications and reserves incident to these methods and to the character of the material, the following general results emerge.

The persons employed in 1924 in those mining and manufacturing industries for which figures are given in the Memorandum numbered about 5,500,000, compared with about 4,700,000 in the same industries in 1907. Since the total number of persons in Great Britain following occupations covered by the Census of Production in 1907 was about  $6\frac{3}{4}$  millions it follows that in our comparisons we are dealing with a sample of about 70 per cent. of the whole. In relation to mining and manufacturing industries proper the sample is even larger—probably more than three-quarters of the whole. The only really important gap in the great exporting industries is the heavy chemical industry\*.

The above conclusion is broadly confirmed by the Note on page 57, where the total number of persons recorded in the 1924 Census of Production for the industries covered by the Memorandum is compared with the total for the same groups of industries according to the Population Census of 1921 after making a conjectural allowance in order to render the figures roughly comparable. It is there shown that, on this basis of comparison, the sample is one of about 78 per cent. So large a sample is sufficient to yield provisional comparisons of great interest, subject of course to the possibility that material corrections may result from the completion and final revision of the results of the Census of Production.

On the basis of our sample, we see in the first place that the numbers employed have increased in 17 years by 17 per cent. The money value of the total "net output" increased in the same period by 131 per cent. and that of the net output per head by 96 per cent. It should be explained that "net output," as used in the Census of Production reports, means the "gross output" less the cost of materials purchased and used and the amount paid for work given out; it thus represents the "added value," viz. the money value of the actual production attributable to the various industries without duplication. In the interval between 1907 and

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\* The results for the Chemical Industries have appeared since the Memorandum was prepared, but too late for inclusion therein.

1924, however, there has been a revolutionary change in the value of money in terms of commodities or (what amounts to the same thing stated inversely) in the general price level of commodities. The Board of Trade Index Number of wholesale prices rose by over 83 per cent. between 1907 and 1924, so that it would appear that the increase in the volume (as distinct from the value) of net output per head over this period was relatively slight. It is evident that the results of improved means of production, changes of business organisation, technical processes, plant and machinery have been largely offset by other factors e.g. the reduction of working hours and the depressed state of employment. In this connexion it must be remembered that the number of employed persons on which the *per capita* output is calculated is the total number on the pay roll and not the number of "equivalent full-time workers". As 1924 was a year of depression compared with 1907, it is probable that if the output per head had been calculated for both years on the basis of "equivalent full-time workers" the results would have been somewhat different. It may be added that if mining were excluded and the comparison of *per capita* output were confined to manufacturing industry proper, a considerably greater rate of increase would be shown.

For the most part, comparative figures of net output for 1912 are lacking, but for 32 industries employing about  $1\frac{3}{4}$  million persons a comparison is possible for the three years 1907, 1912 and 1924 (see page 59). The basis is slender, and the absolute figures of net output for this group of trades cannot be regarded as representative. Nevertheless, they have a considerable comparative value in indicating the general trend. So far as they go, they show a rise of 8 per cent. in the money value of net output per head in the five-year period 1907 to 1912. As this increase is just offset by the rise of general prices in the interval, the position in respect of volume of net output may be regarded as having remained stationary. Without laying too much stress on these partial figures we are entitled to infer that the bulk of any change in net output per head since 1907 actually took place between 1912 and 1924.

Compared with 1907, the mechanical power at the service of industry in 1924 showed a much greater rate of increase than the *per capita* production. The figures now published enable us to compare the power available, i.e. the horse-power capacity of the engines of all kinds installed in the works whether driven by steam, electricity, oil, gas or other mechanical power. Here, again, the reader must be referred to the Memorandum itself for an explanation of the method employed. It need only be emphasised here that the figures given relate to the capacity of engines installed, and not to the amount of power actually used in any year. They enable us to compare broadly the degree of assistance which the persons engaged in industry could receive from mechanical power at given dates, but

they do not measure the actual amount of power which, allowing for duplicated or idle plant, labour stoppages, short time, changes in working hours and all other considerations, was actually consumed by British industry in any one year.

The figures indicate that, in the industries for which figures are given in the Memorandum, the power capacity increased between 1907 and 1924 from something under 8 million to something more than  $13\frac{3}{4}$  million horse-power, i.e. by about three-fourths. Measured per head of the persons employed, the power capacity shows a rise of about one-half. It is, of course, not to be expected that the productivity of an industry will increase in direct proportion to the increase of mechanical power by which it is assisted. For in the first place the amount of power actually used may not have kept pace with the power capacity installed. It is probable that in 1924 a larger proportion of the increased power capacity was in reserve than in 1907 and if allowance be made for this, the percentage rate of increase would be somewhat reduced. In the second place it is evident that *per capita* productivity depends on a number of factors of which mechanical power is only one. Nevertheless, after making full allowance for these considerations, the wide discrepancy between the rates of increase of horse-power and productivity per head of the working population contrasts unfavourably with the corresponding figures for the United States. An estimate based on official figures\* indicates that in the United States between 1904 and 1925 the rates of increase of net industrial production and horse-power per head of employees were almost identical, i.e. about 64 per cent. Such differences naturally suggest the question whether in Great Britain full advantage has been taken of the increased power available, and whether some other factor may not have been simultaneously operating to limit the *per capita* production of industry, or to keep the costs of production above the level at which the full output can be disposed of on economic terms.

The answer to these questions involves an analysis of the factors affecting costs of production and distribution. Such an analysis so far as the data available admit is attempted in the Memorandum on pages 71 to 167. Before, however, discussing the conclusions to which that Memorandum points it is of interest to look at the results of the Census of Production from a slightly different angle, and to enquire what light they throw on the question of the representative character of the great exporting groups of trades referred to above in respect of recent progress. For this purpose the industries covered by the returns summarised in the Memorandum (page 46) have been analysed into two groups, viz. the great exporting trades and all others. The division is not perfectly accurate, but it is sufficiently correct for the present purpose. For

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\* Statistical Abstract of the United States 1926, (figures for output corrected for changes in wholesale prices).

simplicity we will call them Groups A and B. The result is to show that of the  $5\frac{1}{2}$  million persons covered by the returns for 1924, roughly four-fifths are in group A and one-fifth in group B. The rates of increase in the numbers in the two groups between 1907 and 1924 did not greatly differ (18 per cent. for group A and 16 per cent. for group B). When, however, we look at the figures showing increase of mechanical power and *per capita* production we find a great contrast. Thus, the increase in the horse-power available per head was 54 per cent. in group A and 71 per cent. in group B, while the rise in value of net output per head was 87 per cent. in group A and 131 per cent. in group B. Correcting the last-named figures for the rise of prices we see that net productivity per head shows very little change in group A, while it has increased by over a quarter in group B.

This comparative backwardness of group A as compared with group B is attributable in no small degree to the inclusion of mining in the former group. The figures for mining show that with an increase of 40 per cent. in the persons employed (i.e. more than twice the average rate for industries as a whole), the increase in net output value per head was only 41 per cent. (i.e. less than half the average rate for industry). If mining had been excluded the results for the great exporting groups of trades would have been materially different. Thus, the increase of net output value per head would be 107 per cent. instead of 87 per cent., and allowing for the rise of prices the volume of net output per head would be seen to have increased appreciably instead of remaining practically stationary.

### Costs of Industrial Production.

It is a commonplace of economists that under a regime of free competition prices tend to a common level. As regards costs of production, however, there is no such tendency. On the contrary, costs even within the same industry tend to an infinite variety, corresponding to differences among the competing undertakings in respect of every kind of industrial advantage—geographical situation, lay-out of premises, efficiency of equipment, organisation and personnel. Moreover, these differences, so far from being removed by competition, may even tend to become accentuated, inasmuch as the less efficient or well-placed undertakings, which naturally lose trade to their better equipped competitors, are forced to spread their overhead charges over a reduced output, thus further enhancing their costs and weakening their competitive position. Hence, while in any given industry and over a long period of time there must be a general relation between the levels of costs and of prices, no such correspondence can be assumed for short periods, or for individual undertakings, whose costs may vary almost indefinitely among themselves.

As, moreover, the success of a business in keeping down costs is to a large extent a criterion of its efficiency, business men are, not unnaturally, disinclined to disclose the details to their competitors at home or abroad. As a matter of fact, with certain exceptions of which coal mining is the most conspicuous, no generally available statistics of costs of production in this country exist. In view, therefore, of the importance of the matter the Committee have been obliged to make special inquiries for themselves, having especially in view the measurement of recent changes in the general level of costs, and the comparison of these changes with the ascertained increases in prices and wages which have been dealt with in previous volumes.

It will be readily understood that this investigation has been attended with very great difficulty. In addition to the reticence of manufacturers, there are immense difficulties in making exact comparisons, owing to the great changes which have taken place since pre-war times in such factors as the organisation of industry, the precise nature of the products made, and the relation between actual and potential output. Though, however, for these reasons the results obtained are somewhat limited and partial, the analysis of these results is of the very highest interest, in view of the crucial importance of the question of costs for the purpose of the present inquiry.

The results of the investigation are given in detail in the Memorandum on page 69 and the accompanying tables. The tables on pages 124-149 give a comparative analysis of costs of production in a pre-war year (usually 1913) and a post-war year (usually 1924 or 1925) for fifty undertakings or groups of undertakings, mostly in the great exporting industries. In some cases the analysis relates to the average of a large number of undertakings considered to be representative of the whole industry; in the remaining cases it represents the experience of individual firms or groups of firms. The statistical basis is undoubtedly slender, but in the absence of comprehensive figures, the returns summarised in the tables undoubtedly yield results of great interest. In the Memorandum referred to full warning is given of the many pit-falls which await the investigator who seeks to compare costs of production at two different periods, especially when in the interval the economic conditions have been violently perturbed. Every effort has been made in the tables to ensure that so far as practicable like is being compared with like, but it is not possible to be certain on the point, though where the figures represent averages for a large number of undertakings differences affecting individual firms will to a considerable extent cancel out. In the following summary the fifty cases are treated merely as so many "exploratory borings" made more or less at random.

Taking first the comparison of total costs in the pre-war and post-war year we find a very wide range of difference both as between different industries, and within the same industry. Naturally, the

returns from individual firms show a greater range of divergence from the pre-war level than those representing large groups of undertakings in which the extreme cases are "diluted" by the process of averaging. If the fifty entries of total costs for 1925\* be arranged under five great groups of export trades, and these groups be weighted roughly according to their relative magnitude, the resulting average cost level is round about 184, the corresponding figure for 1913 being denoted by 100. We may without great risk of error infer that the average rise of industrial costs in the great exporting trades between 1913 and 1925 has been in the neighbourhood of 80 to 90 per cent.

This indication of the average increase of total costs is of considerable value in giving a standard or "norm" by which to measure the eccentricities of particular cost variations. It does not, however, carry us very far, without an exploration of the differences between different industries. Among the examples analysed, the total costs as compared with 1913 (=100) ranged from 120 (Heavy Oil Engines), and 133 (Blasting Explosives) at the one end of the scale, up to 275 (Egyptian cotton spinning) at the other. Of the groups of trades the Textile group with an average of 225 shows much the highest rise, while Shipbuilding (147), Iron and Steel (162), General Engineering (166) and Chemicals (174) show the lowest rates of increase.

The excessive increase of costs in the Textile group is, of course, mainly attributable to the great rise in the cost of raw material, of which the great bulk is imported. The returns of undertakings in the Cotton trade show that on the average nearly three-quarters of the cost of production both in spinning and in weaving is represented by the cost of materials, and that on the average the cost of materials in 1925 was 236 as compared with 100 in 1913.

In other cases a great part of the increase of costs is attributable to a decline in production, and a consequent increase in the burden of overhead charges per unit of output. An illustration is afforded by an engineering undertaking in which the ratio of actual to potential production fell by 45 per cent. between 1913 and 1925. Total costs increased during the same period by 95 per cent., but the owner of the undertaking calculated that the increase of costs would have been only 65 per cent. if the former rate of actual to potential production had been maintained. Another example is supplied by the collective experience of the agricultural machinery trade, the output of which in 1923 fell to 45 per cent. of its pre-war level, while total costs rose on the average to 210, a figure very much above the average for general engineering as a whole. In this case "overhead charges" increased to three times the pre-war amount and formed no less than one-quarter of total costs.

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\* For brevity the post-war year is described as 1925, which is the year to which most of the figures relate, though they apply in some cases to 1924 or 1923.

The figures in the returns relating to Wages Costs have a special interest for the present inquiry, and in spite of their partial character, they repay careful analysis. The first point to notice is the very widely different percentage of total cost of production which is represented by wages of labour employed (directly or indirectly) on production in different industries, and even in different undertakings in the same industrial group. Broadly speaking, the differences between industries depend mainly on two factors (1) the degree to which the industry is self-contained as regards materials or is dependent on expensive materials purchased from the outside; and (2) the degree to which labour is assisted by machinery and other forms of fixed capital.

The available figures indicate that, in the cost accounts of the great exporting trades as a whole, the average proportion borne to total cost by the wages of labour employed directly or indirectly on production is somewhere in the neighbourhood of 30 to 40 per cent. A weighted average of the returns gives 36 to 37 per cent. for 1925. Of course, in addition to this, several other items of cost (e.g. purchase of materials or payments for maintenance) include a large element of wages. We are only dealing here with wages actually paid to persons employed in production in the undertakings making the returns, and the figures given bear no relation to the calculation of the total proportion of the value of the products of industry which represents wages.

The highest percentage for any important industry is that for Coal Mining (70.7). Among the lowest percentages are Coke (about 9 per cent.) and Basic Pig Iron (10 per cent.), the predominant reason in these cases being the high proportion (at least four-fifths) of the total cost which is attributable to raw materials. Similarly, the low percentage (about 15) represented by labour cost in cotton spinning and weaving is mainly attributable to the high proportion of spinning and weaving cost represented by raw cotton and yarn respectively; and in Steel production where wages represent roughly 10 to 15 per cent. of total cost a large proportion of the balance is accounted for by raw materials. In the return for Heavy Chemicals on the other hand, in which the percentage of labour costs is about 20, overhead charges (which include maintenance) are the predominant factor, the item "other expenses" amounting to no less than half the total cost of production.

Between the above extremes, Boot and Shoe Making (27) and Engineering (34) are examples of industries forming an intermediate group as regards the proportion of wages cost

Such being the range and causes of the variation of the percentage which wages cost bears to total cost in different industries, we inquire next what has been the movement of labour costs as between 1913 and 1925, both absolutely and in relation to the movement of total costs.

Using the same statistical methods that were applied to total costs, we find that, on the average, the wages-cost per unit of production in the instances examined in the Memorandum has increased in the interval by round about 90 per cent.\* In the group comprising the Coal, Iron and Steel, Shipbuilding and General Engineering trades the average increase has been less, viz. between 80 and 85 per cent., while the Textile and Clothing groups show increases between 90 and 115 per cent., and the Chemical group (including Dyes, Explosives and Soap) comes highest with an increase of 129 per cent.

The higher percentages in the latter groups are not difficult to explain. For example, the Chemical group which employs a large proportion of relatively low-skilled labour has experienced the full force of the disproportionate rise of wages for unskilled labour to which attention was called in the "Survey of Industrial Relations."† In the Clothing group it is possible that the operation of the Trade Boards Act in levelling up the wages of low-paid labour has produced an appreciable effect on labour costs; and in the Boot and Shoe trades there has certainly been an increase in the amount of labour expended per unit of production, owing to changes of fashion. In the Cotton trade the governing factor has probably been the reduction of hours of labour for which no compensation could be found by speeding up machinery.

It is, however, noteworthy that in all the great groups, with the possible exceptions of Iron and Steel, Shipbuilding and General Engineering, the rate of increase of the labour cost per unit of product shown by the returns exceeds the rise during the same period in the rates of money wages for a full week's work as recorded in our "Survey of Industrial Relations." That Survey led to the conclusion that the average increase of weekly rates of money wages in industry in general was between 70 and 75 per cent. in 1924-25 as compared with 1913. As the rise in wages has been greater among the "sheltered" trades than in the great exporting trades we may conclude that the average rise in the latter has not exceeded 60 to 70 per cent. We thus find a marked discrepancy between the increases in rates of wages and in labour costs, and this in spite of the progress which has undoubtedly been made in the interval in the more efficient equipment of industry with plant and power.

No doubt part of the difference is due to the character of the data. For example the inclusion of indirect as well as of direct wages in the calculation tends to increase the apparent rise of labour costs, since in periods of depression the burden of indirect wages on costs tends to rise owing to being spread over a smaller output. Moreover, in certain cases, noted in the tables, the comparison of wages-costs is inexact owing to changes in the nature of the product or to other

\* Separate particulars of wages are given in 43 out of the 50 cases tabulated in the Memorandum.

† See pp. 10 and 15-16 of that volume.

causes. After making allowance for all necessary qualifications, it would appear that the average rise of direct wages costs in the cases for which comparable data are available has been in the neighbourhood of 75 to 80 per cent. Since as already stated the average rise of weekly rates of wages in the exporting trades has not exceeded 60 to 70 per cent., there remains a discrepancy to be explained.

In the years immediately succeeding the war, the undoubtedly falling-off in *per capita* production was widely and probably rightly attributed to the transitory phenomenon of so-called "war weariness." But by the general consent of our trade witnesses this influence has now passed away; and any effects of the continued employment of disabled men on the average productivity of labour must be relatively small. More serious is the change since the war in the age-distribution of the working population which was discussed in detail in an earlier volume,\* and is again referred to in the Memorandum on Costs (see pp. 95, 98). The tendency also mentioned in that memorandum to retain "pivotal" men in a time of depression must also tend *pro tanto* to increase the burden of labour costs by spreading them over a smaller volume of production. But meanwhile there have been forces working in the opposite direction, e.g. the more efficient organisation of production, the adoption of more mechanical aids to industry, and the changes which have taken place in the proportions of women to men and of semi-skilled to skilled labour. It is not possible to measure the effect of each of these forces separately, but it seems probable that the last-named group of factors must have at least balanced if not outweighed those previously mentioned. In any case it is fairly certain that after taking them all into account we have still to seek for some residual factor capable of accounting for at least part and possibly the greater part of the observed increase in the "real" cost of labour in production. It is difficult to resist the conclusion that this residual factor is the reduction in the length of the working week which has taken place between the dates we are comparing. This reduction, while affecting different industries differently, has, on the whole, averaged about 10 per cent., and it seems clear that, speaking generally, it has not been fully offset by increased productivity per hour.

It is clearly to be understood that what is here referred to is the general or average position as indicated by the available data taken as a whole. No doubt the experience of different industries has varied widely in this respect, some having been able by various expedients (e.g. speeding-up of machinery, re-arrangement of time table, better time-keeping and organisation and other methods of reducing waste) to counteract wholly or mainly the reduction of hours, while in other cases these methods of compensation have not been available or have only been partially effective. But apart from any expedients of this kind, the relation between a change of

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\* See "Survey of Industrial Relations," pp. 69-72.

hours and the resulting change of labour costs is seldom one of simple inverse proportion. To take a single example, a change in the normal weekly hours may often affect the number of hours overtime for which extra payment must be made.

Turning to costs of salaries (i.e. office, management and other similar expenditure) we find the available data more limited than in the case of wages costs, since some of the undertakings include this item under "other expenses." Such comparative figures, however, as we possess show clearly that the proportion of total costs which is represented by salaries, while much smaller than that represented by wages, varies even more widely as between different industries and different undertakings. Among the undertakings covered by the information supplied, the proportion borne by salaries to total costs varied from a small fraction of 1 per cent. up to more than 7 per cent. of the whole. The extreme range of variation in the proportions of expenditure on this item can only be partly accounted for by differences in the proportions between actual and potential production, although it has always to be borne in mind that the bulk of salaries, unlike wages, are practically a fixed charge, which in times of depression has to be spread over a reduced output and consequently is bound to show a relative increase. It is clear that there are wide differences between the circumstances and practice of the several undertakings as regards the services remunerated by salaries and in particular that these services are not really comparable among themselves, owing to the different policies followed as regards marketing.\*

It is to be expected that the rate of growth since 1913 of an item like relative cost of salaries, which varies inversely with the activity of production, would exceed that of wages which is much less affected by this factor; and this is borne out by such statistical data as are available. Other reasons for a high rate of increase in the charge for salaries are the recent tendency to increase the number of salaried employees as compared with those on the wages roll, and the fact that the rates of salaries have been affected to some extent by the high rate of income tax which the recipients have now to pay. The evidence indicates that the average cost of salaries per unit of output has risen to between double and treble its amount in 1913. There are wide deviations among the individual returns, but more than half of them fall between 180 and 280 (1913 = 100), and the final average is probably between 225 and 235. The disproportion between this rate of increase and that of wages cost is adequately accounted for by the fact that the post-war year to which the figures relate was one of depression, in which, for reasons already given, the relative cost of salaries is bound to be abnormally high.

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\* Where possible, the expenses of a selling organisation attached to a manufacturing business have been eliminated from salary charges and included with "other expenses," but probably this has not been possible in all cases.

Of the remaining items in the cost of industrial production the cost of materials is, as a general rule, much the most important. On pp. 85-90 will be found an analysis of the main factors which have affected the cost of materials during recent years. In particular it is shown that the great fluctuations in the price of certain essential raw materials during the post-war period have had a most deleterious effect on costs of production, especially where they cannot be partially offset by devices such as the cotton "futures" market, or the organisation of "vertical" combinations. The latter expedient, indeed, while safeguarding the undertakings which control their own supplies of materials against market fluctuations, may actually intensify the effect of these fluctuations on such undertakings as are not vertically organised. The relative cost of materials not only varies widely as between different industries but also between different undertakings. Not only does the position of the vertically organised undertaking differ from that of the undertaking dependent on buying materials from outside, but the local situation of the undertaking may have a great effect on the cost of the materials it consumes. The element of transport charges which enters into the cost of materials has already been discussed in the preceding volume,\* and it is only necessary to repeat that these charges are often a much heavier burden on costs than the charges for transporting the manufactured article to its market.

The items included under the category of "other expenses" include several expenses (e.g. local rates and "social charges"), the incidence of which on industrial costs was fully described in the last volume (see "Factors in Industrial and Commercial Efficiency," pages 57-62 and 473-492). They are in the main beyond the control of those engaged in the industry itself. To some extent this is also true of the expenditure on power, light, water, heating, etc., though as regards power and light many works are self-contained. Naturally the proportion of total costs represented by this item (power, light, etc.) varies widely with the technical character of the industry, but the average of the returns is between 2 and 2½ per cent. of total cost. The average cost of the power, heat, etc., consumed per unit of output has roughly doubled since 1913. It is not, however, legitimate to infer that the cost of the same amount of power has gone up in this proportion, since, as shown in a previous section of this Introduction, there has undoubtedly been a great increase in power capacity in the interval.

The item for maintenance and depreciation has risen very greatly, partly because there has been a substantial extension of power and other plant, partly because overhead charges have been spread over a diminished output, but also because a large amount of capital construction took place at the inflated prices of the war period and

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\* See "Factors in Industrial and Commercial Efficiency," p. 493.

the charge for depreciation has been correspondingly high. Moreover, as is pointed out in the Memorandum, work of maintenance and repair is often executed in slack periods, so that the recent years of depression have doubtless borne more than their normal share of these expenses.

The effect of capital inflation on costs is of sufficient interest to be discussed separately (*see* page 20).

Not only do the relative levels and rates of increase of costs of production differ widely as between different industries and undertakings, but they frequently vary considerably from district to district. Though the available data do not always permit these local differences to be measured statistically they can sometimes be inferred indirectly from the observed shifting of the centre of gravity of an industry from a region of high or increasing costs to one more favourably situated. A good example is afforded by recent movements within the iron and steel trade and industries ancillary thereto. The virtual exhaustion of ironstone in Scotland and the high cost of local ore on the North-East coast of England have compelled these districts to rely largely on ore or pig iron transported from other areas, or imported from abroad. On the other hand, Lincolnshire and the East Midlands have enjoyed the advantage of the proximity of cheap ironstone. The effect on costs of this difference of situation is shown by the fact that while Lincolnshire and the East Midlands more than maintained their output of pig iron, the output of pig iron for steel-making in Scotland and the North-East Coast fell by 1,300,000 tons between 1913 and 1924. The result of this and other local differences (e.g. the depression in ship-building) has been that the centre of the steel industry has shifted southwards, Lincolnshire and the Midlands having increased their steel production by 700,000 tons, while in Scotland and the North East Coast output declined by 500,000 tons. The coke industry, which has been revolutionised during the last 20 years, is now much more closely attached to the iron and steel works than formerly, in view of the large use made by these works of the surplus gases of coke ovens. Hence it is not surprising that the coke industry has followed the movement of iron and steel; the production of Durham has declined relatively to that of Yorkshire and the industry has appeared in Lincolnshire.

In the above example, one of the principal causes of the shift southward was the exhaustion of the northern ores, which supplied only one-third of the national output in 1924 as compared with over one-half in 1913. In other industries, other but no less potent causes of migration have been at work. Thus the marked tendency of some of the newer and more progressive branches of the engineering trade, such as the motor industry, to develop in the South or Midland districts rather than in the North is probably connected —

with the desire to obtain the full benefit of the reduced costs of production resulting from more economic organisation and free from the restraint of hard and fast trade custom and restrictions.

The above are only two examples of the local redistribution of industries which has been and is still going on, and which is of such great importance to the right appreciation of the present industrial situation and prospects that it is examined more closely and in a more general form in a separate section of this Introduction (see page 23).

### Costs of Distribution.

The costs of retail and wholesale distribution are dealt with so far as the available information permits in the Memorandum on page 108.

It may seem at first sight that the costs of wholesale and retail distribution in this country can only be of minor importance in relation to the great export industries whose chief markets are overseas. This view, however, is unduly narrow, for almost all export industries also produce more or less for the home market, and the extent and profitableness of this market may often be of crucial importance in determining their competitive strength in exporting to overseas countries. More than one trade witness before the committee complained strongly of the wide margin of difference between the price of his products at works and the price at which they are offered for sale in retail shops, and they attributed to this difference no small part of the decline in home consumption of certain classes of goods, which in turn has weakened the position of British manufacturers in relation to export. It becomes therefore of importance for the purpose of this inquiry to know what is the addition to the manufacturers' price which the home consumer has to pay to meet the charges of distribution, what have been the changes in recent years in these charges, and how they are divided between the expenses and net profits of the wholesale and retail distributors. Nor is our interest in these matters limited to the actual products of the great exporting groups of trades, since anything which affects the cost of distribution of articles of general consumption necessarily affects the level of retail prices, and therefore the spending power of consumers. The more they require to spend on food and other necessities other than the products of British manufacture, the less, *ceteris paribus*, will be their effective demand for the latter products. Moreover the retail prices of necessities determine the movement of the "Cost of Living" index number which in accordance with the rates of wages about 2½ millions of workpeople are periodically varied \*

It is, unfortunately, very difficult to obtain comprehensive and accurate information as to distributors' costs and profits, and the

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<sup>1</sup> \* See "Survey of Industrial Relations," pp 109-110.

task is greatly complicated by the different methods and channels by which distribution is effected in different trades or even within the same trade. The practice of direct sale by the manufacturer to retailers or even to the public exists side by side with every form and combination of intermediary agencies (merchants, wholesalers, factors, departmental stores, multiple shops, etc.), as well as with the vast organisation of wholesale and retail distribution through co-operative societies, which was described in our third volume.\* The difficulties of arriving at any sound comparisons are set out in the Memorandum. Nevertheless, in spite of the paucity of the data certain conclusions of considerable interest can be drawn, especially as regards recent changes in the costs of retail distribution. For this purpose the accounts of two great departmental stores, and of three important retail co-operative societies have been analysed, while with regard to groceries and provisions details for 1925 have also been obtained in regard to six proprietary businesses.

The result is to show that the "gross margin" between the cost to the departmental stores of the goods they offer for sale and the price at which these goods are sold retail to the consumer averaged 26 per cent. of the *retail price* in 1925 as compared with 20 per cent. in 1913. The corresponding "gross margin" in the case of the three co-operative societies averaged  $20\frac{1}{2}$  in 1925 and  $19\frac{1}{2}$  in 1913. The considerable difference between the "margins" in the case of the Departmental Stores and the Co-operative Societies is principally accounted for by differences in the character of the goods sold. For example, groceries and provisions account for a much larger proportion of the sales of the Co-operative Societies than of the Stores, and in these branches of trade the margins are usually lower than in other departments.

It is to be noted that the "margin" is calculated as a percentage of the retail price, and therefore takes into account the rise of prices since 1913. It may, therefore, be concluded that on the average the charge made by the retailer for the services which he performs (i.e. his "gross margin") has increased since 1913 by a greater percentage than the price charged by the manufacturer for his products. The increase has been greater in the case of the Departmental Stores than in that of Co-operative Societies, the margin on groceries and provisions having actually declined. It remains to inquire how far this rise of the "gross margin" represents increased expenses or more extensive services performed, or how far it represents an increase of "net profit" to the retailer.

The expenses of the three Co-operative Societies in 1925 represented  $13\frac{1}{2}$  per cent. of their sales as compared with 10 per cent. in 1913. Those of the Departmental Stores in 1925 represented 20 per cent. of their sales, as compared with 15 for 1913. Thus, between

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\* "Factors in Industrial and Commercial Efficiency," p. 114, etc.

1913 and 1925 the proportion of expenses to sales increased in both cases by about the same proportion, i.e. about one-third. Partly this increase in costs is due to improved services, especially of delivery, and (in the case of the Departmental Stores) possibly to an extension of advertising. But the fact that the proportion of total expenses represented by salaries and wages has remained practically constant at rather more than 60 per cent., both in the case of the private and the co-operative concerns, suggests that part of the rise of expenses is attributable to the increase of salaries and wages.

The balance between the "gross margin" and the expenses represents the net profit or distributable surplus. In 1925 this surplus averaged 6 per cent. on sales in the case of the Departmental Stores and about 7 per cent. in that of the Co-operative Societies. In the case of the six proprietary grocery businesses, the average net profit was just under 5 per cent., but it is not certain how far this percentage includes the remuneration of the proprietor.\* While the rate of net profit or surplus realised in 1925 by the Departmental Stores and the Co-operative Societies did not differ greatly, the Co-operative Societies' net surplus declined by, roughly, one-quarter as between 1913 and 1925, while that of the Departmental Stores was maintained or even slightly increased over the same period.

The figures available for the cost of wholesale distribution are too limited to enable any safe comparisons to be made. The experience of the great wholesale Co-operative Societies is of considerable interest, but their position as central buying agencies maintained by associated retail businesses is so different from that of a Wholesale Merchant who has to provide more warehouse accommodation and often long credits and has a much less assured market, that no comparison between expenses or margins under the two systems is possible.†

The Co-operative Wholesale Societies' Accounts show gross margins averaging about 4 per cent. of their sales in 1925. Of these margins about  $2\frac{1}{2}$  per cent. represented expenses and  $1\frac{1}{2}$  per cent. was net surplus. Though for reasons given above it is not possible to compare these percentages with any corresponding figures for wholesale distributing firms they can be compared with the gross and net margins realised by the same societies in 1913. These averaged about 5 and 3 per cent. respectively, showing that the gross margin

\* With all these figures may be compared the results given on page 463 of the volume on "Factors in Industrial and Commercial Efficiency" for the average rate of profit of companies engaged in retail distribution in 1923 based on Income Tax returns. The average or mean was 5.14 per cent.

† In this connection it has been observed that the tendency of the retailer to purchase in smaller quantities has *pro tanto* increased the responsibilities and expenses of wholesalers in respect of stock holding, except in so far as they throw back the burden on to the manufacturers.

declined by one-fifth and the net margin by one-half, the ratio of expenses to sales having increased in the interval from 2 to  $2\frac{1}{2}$  per cent.

The figures supplied to us of the gross and net profits of a wholesale textile house are of a different order from the above and they have followed a different course. It is evident that they represent charges, costs and profits in respect of quite dissimilar services. The gross profits of this distributive business rose from 13.6 to 14 per cent. of sales, while expenses increased from 11.9 to 12.6 per cent., leaving net profit of 1.7 and 1.4 per cent. of sales respectively in the years 1913 and 1924.

All the figures relating to distributive costs and profits must be taken with great caution having regard to their slender basis. So far as they go, however, they suggest that, of the retail price of commodities as a whole, something in the neighbourhood of one-third goes to the wholesale and retail distributors, and the remainder to the producers and transport agencies. Of course there are very wide deviations from this average, and the figures quoted on page 110 of the margins allowed for distribution by manufacturers who sell direct to retailers (thus cutting out the wholesaler) vary from 12 $\frac{1}{2}$  to 30 per cent. or more, according to the class of goods. On the whole, however, these figures for retail margins are fairly consistent with the rough estimate given above.

Of the share (say one-third) of the final value of the product which goes to the distributors roughly three-quarters (or say one-quarter of the whole retail price) is absorbed by distributive expenses, and one-quarter (or say about 8 per cent. of the whole retail price) represents the net profit of distributors wholesale and retail.

The retail value of the product, after deducting the share of distributors, is divided very unevenly between the producing and transporting undertakings according to the character of the goods, and in particular according to the relation between their bulk and value. The question of costs of railway transport was dealt with in the preceding volume\* where it was shown that the cost of transporting goods from works to final destination may vary from an almost negligible percentage of value in the case of textiles and other relatively light and valuable goods up to an amount which in the case of exported coal averages over 9 per cent. of the export value, and in that of home-consumed coal reaches a still higher percentage of the ultimate price. The range of cost of transport being so wide, a mere average figure would have little significance, but the Memorandum published in the previous volume indicated that, with certain exceptions for heavy goods carried over short distances, the cost of railway transportation bore a somewhat lower proportion

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\* "Factors in Industrial and Commercial Efficiency," p. 493, etc.

to ultimate price in 1925 than in 1914. Since that time, however, there has been an increase in railway rates and also a fall in the general price level. The indications are that at the present time the above conclusion would not hold good.

### Over-Capitalisation and Costs.

In connexion with Overhead Charges the question has often been raised whether a part at least of their increase may not be due to "over-capitalisation." It has accordingly been thought desirable to obtain expert advice from a highly competent accountant as to the possible effects of over-capitalisation on costs and prices and generally on the successful conduct of industrial enterprise. The results are embodied in the Memorandum on Over-Capitalisation (see page 170).

The term "over-capitalisation" is a loose one which is sometimes used to cover phenomena of very different kinds. For example, an undertaking equipped to produce up to a given capacity may in a sense be termed "over-capitalised" if owing to market conditions it is only producing half its potential output. No one doubts that the "overhead charges" per unit of production of an undertaking so situated are greatly in excess of those of a similar factory in full employment. It conduces, however, to clearness of thought to confine the expression "over-capitalisation" strictly to the results of increasing the capitalisation of a business otherwise than in proportion to increases in its material equipment or working capital, e.g. by re-valuing its existing assets at a higher figure or by capitalising its reserves, or by one of the various means of "watering its capital" described in the Memorandum.

The operation of inflation may be performed in different ways, e.g. by the issue of bonus shares or by the establishment of a new company to which the assets are sold at inflated values. Except for the special purpose of determining the income-tax rebate allowance in respect of depreciation it is economically immaterial which of these expedients is adopted. Either of them may have, and not infrequently has, deplorable results on the efficient conduct of the business unless the increased capitalisation is justified by sound economic reasons. On the other hand neither operation can have any material effect on the level of costs of production, unless it involves the increased valuation of such material assets as plant and buildings on which depreciation is charged. In that event the charge for depreciation which figures in the cost of production will *pro tanto* be increased. It is, however, probable that most recent cases of gross over-capitalisation resulted to a preponderating extent not from the over-valuation of material assets but from an excessive estimate of the probable level of future maintainable

profits.\* Over-capitalisation due to this cause can only have an effect on cost of production if part of the excess capital consists of debentures or loans on which interest has to be paid whether or not profits have been earned. In the over-capitalisation in the cotton spinning trade referred to below, this feature was present to a marked extent. Over the whole field of industry, however, such cases are exceptional, and apart from them it is broadly true that over-capitalisation which does not involve increased depreciation charges has no effect on costs.

Nor can the over-capitalisation of individual undertakings have any material effect on the level of prices, so long as free competition is maintained, and the over-capitalised undertakings are not in a position through a price-agreement or other form of combination to maintain prices at a non-competitive level. In cases in which such combinations or price agreements exist, it is possible that the common price policy may be affected by pressure from the over-capitalised undertakings which are among the parties to the agreement. If these undertakings are sufficiently strong to exercise a predominant influence they may succeed in establishing a range of prices, at least in the home market, sufficient to yield dividends on their inflated capital. If, on the other hand, their influence is not predominant they will have to follow the prices fixed to suit the other concerns which are not over-capitalised. An example of this conflict of interest was afforded by the recent unsuccessful effort of the Cotton Yarn Association to fix the price of cotton yarn. The cotton spinning industry has recently afforded a very glaring example of systematic over-capitalisation, and the experience of that industry is described in detail in our "Survey of Textile Industries."

If the above conclusions are sound, and if it be true that under free competitive conditions over-capitalisation cannot affect prices, and can only affect costs in a minor degree, it must not, therefore, be inferred that the evils so widely attributed to over-capitalisation are purely imaginary. On the contrary, they are very real and serious, though they are not of the kind commonly supposed. In the first place the pressure to pay dividends on the inflated capital tends towards insufficient provision for reserves, depreciation, and working capital, and the almost inevitable effect of such conditions on the minds and policy of the men who manage the business is to paralyse their initiative and to fetter their freedom in taking risks, while diminishing their power of building up reserves out of savings on which the expansion of business depends. Besides these sources of weakness the over-capitalised undertaking suffers from the psychological defect that the low rates of dividend, which are all that its profits will yield when spread over its inflated capital, may frequently

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\* This was true of the cotton spinning section during the trade boom in spite of the fact that the purchase price of the reconstructed cotton mills may have been expressed in terms of so much per spindle.

give an appearance of inefficiency and detract from the reputation of the business. The power of the undertaking to float a loan or to obtain banking accommodation may be seriously impaired, and in cases in which a considerable amount of its capital is in the form of debentures or other loans it may be driven to weak selling in order to find the interest on such loans.

For these and other reasons, sometimes of a personal character, the directors and owners of over-capitalised concerns are frequently well advised in adopting schemes for the reduction of capital in order to restore health to a company's financial and economic position. Other collateral advantages are not seldom sought and obtained at the same time. For example, a reconstruction of this kind may afford an opportunity for drastic changes in management which otherwise would prove difficult to carry out. It is, however, a fallacy to suppose that such a reduction of capital *of itself* can automatically enable a concern to produce more cheaply or to sell on better terms, or to pay higher wages, though in the long run all these advantages may accrue from the restoration of the economic health and good name of the undertaking and the renewed vigour and initiative of its management.

The issue of bonus shares does not necessarily involve over-capitalisation, though it is one of the methods by which over-capitalisation may be effected. The question whether the higher valuation of assets is, or is not, justified depends entirely on the circumstances of the case. It is only justified if, to quote the words of the Memorandum, "the re-valuation represents a permanent and certain higher value in normal times and conditions." How very far certain re-valuations and inflations of capital which were effected immediately after the war were from satisfying this condition may be judged from the description given in the "Survey of Textile Industries" of the over-capitalisation which took place in the cotton trade during the boom period following the war.

In the years 1919 and 1920 over two hundred cotton spinning undertakings changed hands at grossly inflated prices based on momentary conditions, and on the unreasonable expectation that these conditions would continue. In addition, between 30 and 40 companies which did not undergo reconstruction were re-capitalised on the same extravagant basis, either by transfer to a new company without substantial change of control, or by the issue of bonus shares. The precise amount of the total inflation cannot be stated, since many of the undertakings in question possessed assets not represented by their share capital. On the basis, however, of information relating to a large sample of the "reconstructed" companies, it appears that the total sale price was about eight times the paid-up share capital of the concerns acquired, and that rather less than half the sale price was represented by the paid-up share capital of the new companies, the balance being made up of loans, realisation

of assets, or profits on current contracts. In the aggregate, the over-capitalised concerns of all kinds own not far short of half the total number of spindles in the industry and considerably over half the number of spindles in the "American" spinning section. The depression set in before the new companies had time to get to work, and many of them have paid no dividends since 1920 or 1921.

It is of interest to compare the subsequent fortunes of the over-capitalised cotton spinning undertakings with those which remained on their former financial basis. Particulars are available for a group of about 310 companies, including 210 "reconstructed" mills with about 21 millions of spindles, 35 other re-capitalised mills with about  $3\frac{1}{2}$  million spindles, and 65 concerns unaffected by inflation which own about  $6\frac{1}{2}$  million spindles. The average dividends paid in the seven years 1921 to 1927 by the first group were 1.3 per cent., by the second group 6.9 per cent., and by the third group 8.7 per cent.

There is no question that the gigantic financial operations by which so many of the Lancashire cotton spinning mills became over-capitalised have seriously added to the economic difficulties of the cotton industry in the various ways indicated above. The fact that these mills have continued to rely to a considerable extent on loan capital withdrawable at short notice has increased the embarrassment. Many efforts to escape from the difficulties by measures of reconstruction or combination have been tried, of which the latest, that of the Cotton Yarn Association appears, at least for the time being, to have failed.

It is one of the most disquieting phenomena of recent years that shrewd business men with local knowledge and experience should have allowed a great staple industry to fall so easy a victim to speculators and company promoters. No doubt the circumstances of the moment were exceptional and the temptation was strong; but the whole transaction is a remarkable illustration of the importance of the psychological factor in disturbing human judgments and forecasts. We shall meet the same phenomenon in our analysis of industrial fluctuations.

It must not, however, be supposed that in this matter the cotton trade stands alone. Cases of reckless over-capitalisation might be quoted from the post-war history of other trades and industries.

### Industrial Mobility.

#### (i) *Internal.*

Incidental reference has been made in connection with the discussion of industrial costs and output to the changes which have taken place in recent years in the industrial and geographical distribution of the trades of Great Britain. If it be desired to trace and measure the flow which has taken place between different industrial groups and areas, a different procedure must be adopted -

according as the aim is to obtain a broad and general view of tendencies over a considerable length of time, or to make an intensive study of changes during a few recent years. For the former purpose we must have recourse to the successive Census inquiries which have been carried out at intervals of ten years. For the latter purpose a much more effective means of observation is now afforded by the records of changes in the number and distribution of persons insured in various industries under the Unemployment Insurance Acts.

Turning first to the long period changes, the decennial Census figures are set out in the table on page 253, which summarises for Great Britain as a whole the Census results of England and Wales and of Scotland, from 1901 to 1921. Owing to changes of classification in 1921 the continuity of the absolute figures is interrupted, but this break of comparability can be surmounted by the method of percentages adopted in the Tables. It will be seen that as between 1901 and 1911 the total number of persons engaged in the great exporting trades increased by 20 per cent. as compared with an increase of only  $12\frac{1}{2}$  per cent. in the total occupied population. In the next decade (which of course included the very abnormal war period) the total occupied population only grew by  $5\frac{1}{2}$  per cent. Nevertheless, the rate of increase of the same group of industries was even greater than in the previous decade, viz. 21 per cent. These figures show that throughout the twenty years, but more especially in the latter half of that period, there was a movement into these trades at the expense of other industries. In particular the coal mining and the metal and engineering trades increased much faster than industry as a whole. In 1921 the number engaged in these two groups of trades was greater by nearly a third than in 1911—a rate of increase nearly six times as great as that of the occupied population as a whole. But while in the earlier decade the prime cause of the movement was the normal development of overseas trade, the expansion as between 1911 and 1921 was due to a wholly different cause, viz. the pressure of war requirements, which led to the forced expansion of the munition producing trades, and left the country with a legacy, not yet liquidated, of "hypertrophied" industries.

The ebb and flow of numbers engaged in the cotton trade present interesting features. Between 1901 and 1911 the number engaged in this very important industry rose by 76,000, or 14 per cent. By the year 1921 the number had fallen by 25,000, or roughly 4 per cent., showing clearly the effects of foreign competition and the growth of cotton production abroad on the prosperity of the Lancashire staple trade. There are, of course, no Census figures later than 1921, but it is practically certain that there was a further fall to the middle of 1923. During the next three years, however, the tendency was reversed in spite of the severe and long continued

depression. The records of unemployment insurance show that the number of persons insured in the cotton industry rose gradually, though slowly, from 1923 to 1926, and, though the latest figures for the middle of 1927 show a decline, they are still above the level of 1923. In this connexion it is to be remembered that the short-time arrangements in the cotton spinning trade have been so organised as to enable work people to draw unemployment insurance benefit during the periodic spells when, under the arrangement, they are not working; and it seems possible that the effect may have been to check the natural tendency of a depressed industry towards a shrinkage in numbers.

The records of Unemployment Insurance, the scope of which was practically extended to all the great industries in 1920, afford the best means available for tracing changes in the industrial and geographical distribution of the trades of Great Britain during the short period which has since elapsed. The figures showing the growth and shrinkage of the insured population engaged in given groups of industries, or living in given areas, furnish a very sensitive barometer of the internal movements and shiftings of trade. The method is only satisfactory for short period comparisons, both because comparable figures only began to be published in 1923 and also because changes in numbers employed are only a very imperfect measure of changes in industrial production over a long period, during which great changes of organisation and methods may have been introduced. To take a particular case, it may be mentioned that the numbers occupied in the woollen and worsted industry have remained stationary since 1851, while production has practically trebled.

It is, however, since the war, and doubtless largely owing to the pressure of the vast economic forces set free by that catastrophe, that some of the most interesting and significant changes and shiftings of industry have taken place, and it is, therefore, of great interest to make a comparative examination of the insurance statistics for 1923 and 1927 in order to see what light they throw on the problem of interchange and mobility. The necessary data compiled by the Ministry of Labour are given in Chapter V, page 232, and show that certain branches of industry in Great Britain have declined and others have grown during the four-year interval when measured by the test of the number of insured persons by whom each is followed. The tables also show which parts of the country have grown and which have declined as industrial areas. The figures show that the number of insured persons in Great Britain increased from about  $11\frac{1}{4}$  millions in 1923 to rather less than 12 millions in 1927, an increase of nearly 6 per cent. But this increase was very unequally distributed both industrially and geographically, and in fact represents the balance between increases in one group of expanding industries and decreases in another group of relatively

shrinking trades. Among the latter group are found the bulk of the great exporting industries which the Committee have selected for special examination. For example Coal Mining, Iron and Steel, General Engineering, Shipbuilding and Marine Engineering, and Woollen and Worsted account for an aggregate decline of 200,000 persons while the only important industries of the exporting group which show substantial increases are the electrical trades (27 per cent.), the motor industry (21 per cent.), and artificial silk (48 per cent.), which together account for an increase of about 90,000. These are all comparatively new and progressive branches of production. On the whole, the group of great exporting trades shows a net decline on balance of 65,000 insured persons in the last four years. The principal great groups of trades showing high rates of increase were the distributive trades (25 per cent.), and the building and furnishing trades (19 per cent.). The connexion of the latter increase with the house famine is obvious.

The above indications confirm the view, which is suggested by ordinary observation as well as by the figures of the Census of Production, that in the last few years the great exporting industries have not fully kept pace with other industries and occupations in Great Britain. This conclusion is further borne out by the statistics of unemployment which show that for the dates given in the Memorandum during the four years 1923-27, the percentage of unemployed has averaged 13.5 in the great exporting trades and only 9.2 in the other insured industries.

Not less significant than the industrial changes indicated by the above figures are the statistics showing the geographical distribution of the insured population at the two dates compared. In July, 1923, the insured persons were divided between the Southern and Northern Sections of the country in the proportions 45.7 (South)\* to 54.3 (North).\* During the four-years period to July, 1927, the southern proportion has grown to 47 and the northern has declined to 53. Looking at the matter from another point of view, the total increase in the number of insured persons was 601,200, of whom 433,000, or nearly three-quarters, were in the south. Thus, while on the whole the number of insured persons increased by 5.3 per cent., the number in the south increased by 8.3 per cent., while that in the north rose only 2.7 per cent. The indication of movement is still more striking if we look separately at the figures for the south-eastern counties, which show an increase of 15.8 per cent.,† while Wales shows an increase of less than 2 per cent., and the north-east coast of only about 3 per cent.

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\* "South" includes London and the South Eastern, South Western and Midland divisional areas for the purpose of the Unemployment Insurance Acts. "North" includes the rest of the United Kingdom.

† Excluding London.

These figures amply confirm the indications already given, in connexion with the analysis of costs of production, of a southward shifting of the centres of gravity of certain trades due partly to causes connected with the supplies of raw materials, partly also to the desire to reduce costs in other ways. The tendency is further confirmed by the testimony of the Factory Inspectors, embodied in successive reports of the Chief Inspector. The Report for 1926 calls special attention to the progressive industrial development in the outer London suburbs and the home counties in spite of the special trade difficulties of the year. While some of the new factories are due to an overflow from congested London areas, others represent entirely new businesses, and the development is taking place especially along the routes of new roads and railway extensions. Nor is the observed growth confined to the home counties ; it is noticeable also throughout the area lying south and east of a line drawn from the Wash to Portsmouth. Additional confirmation of the trend is afforded by the statistics of the number of industrial accidents, a fairly trustworthy test of industrial activity.

If, as is suggested, the local re-distribution of industry is due to economic pressure, it would be natural to expect a lower percentage of unemployment in the south than in the north ; and the statistics confirm this expectation. In the country generally the percentages unemployed in the middle of 1923, 1925 and 1927 were 11.3, 11.9, and 8.8 respectively. In 1923 the average percentage in the southern area was 10.2, and in the north 13.1. In 1925 the average percentage in the south was 8, and that in the north 14.3. In 1927 the difference was still more striking, the percentage in the south being only 6.7, as compared with 12.6 in the north. Of course, in this comparison we are not comparing like with like from an industrial point of view, the proportion of "sheltered" trades among the insured industries in the south being materially greater than in the north. The figures, however, show clearly that the centres of acutest unemployment are those (e.g. the North-East Coast and Wales), where the increase of the industrial population has been least, and that the lowest proportions of unemployed are in the areas (London and the southern counties) where the increase has been greatest. The southward movement and the industrialisation of non-urban areas in the South of England are comparatively new phenomena, the full development of which lies in the future, and is likely to be stimulated and expedited by the transmission of electric power to rural districts, and other forces making for decentralisation.

The changes which have taken place over a much longer period (i.e. from 1881 to 1921) in the distribution of the population, and its concentration in urban areas and in the vicinity of the great ports, are dealt with in the Memorandum on Transport Facilities (see page 196). The object of that Memorandum is to explore the

situation of the great mass of the population as regards favourable access to transport facilities for the materials and products of industry. It is shown that the proportion of the entire population of Great Britain living within fifteen miles of one of the twelve principal ports was about 45 per cent. of the whole, both in 1911 and 1921, and that it had gradually grown to this proportion from 1881, when the percentage was 41. The decade of most rapid concentration was 1881-1891, during which the proportion rose from 41 to 43.4 per cent. In the two succeeding decades the tendency continued, though at a much slower rate, but between 1911 and 1921 it came to a standstill.

Another way of looking at the problem of concentration is to consider the relative growth of population in the urban and non-urban areas respectively. The figures for England and Wales show that the proportion of the population living in urban areas rose continuously from two-thirds in 1881 to four-fifths in 1921. The progress, however, of urban concentration was more than four times as rapid in the first half of the forty years period as in the second. It is clear that the population of Great Britain has attained a very high degree of concentration and urbanisation, over half dwelling in five great industrial districts which comprise only one-tenth of the whole area of the country. It is equally clear that the process of concentration has slowed down very greatly in the past twenty years, and it is not improbable that the process of decentralisation of industry, the symptoms of which have already been referred to, may have already reversed the tendency, and that to-day the centrifugal forces are more powerful than the centripetal.

### (ii) *External.*

Besides the internal movements and readjustments of industry within Great Britain which are referred to above, a certain interchange of population is continually going on by migration between Great Britain and overseas countries, but the volume of this interchange has greatly decreased since before the war.\* In 1913 the gross outward flow of adult male British emigrants, including migration to other parts of the Empire, was 164,000 while the annual average of the six years 1921-26 was only 76,000. Against this outward flow there was in both years a smaller inward flow of British subjects so that the net annual British emigration of adult males was 124,000 in 1913, and 53,000 on an average of the last six years. These figures are not truly comparable owing to the exclusion of Southern Ireland in the last two years. If in order to avoid this disturbing factor the years 1925 and 1926 are excluded, we find that the net British emigration of adult males from the British Isles in 1921-24 averaged 60,000 a year, or less than half the number in the year preceding the war. It is unfortunate that,

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\* See Memorandum, p. 249.

owing to a change in the basis of the statistics in 1913, we are only able to bring a single pre-war year into comparison, but a glance at the figures showing the annual balance of outward and inward passengers of British nationality does not suggest that the year 1913 was in any way exceptional.

The first salient fact about the migration of British men overseas is, therefore, that its volume is less than half what it was before the war. In only one year, 1923, did the net number of such migrants approach the pre-war level, and a further analysis of the figures shows that about three-fifths of the total for that year (64,000 out of 108,000) were skilled tradesmen, or labourers connected with skilled trades. No other post-war year has approached within half of this total. The figures in Table 10, page 255, show that this exceptional emigration of persons following skilled trades in 1923 was mainly directed to the United States and Canada. Nearly one half of the total skilled tradesmen were in the engineering and metal trades, and five-sixths of these went to North America. No doubt the increase was partly due to the anticipation of further restrictive legislation, but there can be little doubt that the primary cause of this sudden outburst of emigration of skilled tradesmen to America was the rapid recovery of the United States in 1922-23 from the depth of the industrial depression of 1921-22. In Great Britain also there was a revival but it was far less rapid and complete. The equally sudden decline of the movement after 1923 is attributable wholly or mainly to the incidence of the American Immigration Act of 1924. As the "quotas" fixed under that Act apply to the fiscal years (July to June) and the migration from the United Kingdom during the last half of 1923 practically exhausted the quota fixed for 1923-24, the 1924 figures for British emigration to the United States really represent only six months' movement. But though for this reason the statistics somewhat exaggerate the suddenness of the decline in the emigration of skilled tradesmen to the United States, the total for the three years 1924-26 (even after making an adjustment for 1924) averaged less than 3,000 a year or only about one-ninth of the figure for 1923. To the legislative action of the United States must, therefore, be ascribed no small part of the reduction in the drain of skilled tradesmen to that country after the momentary increase in 1923. The reduction in the flow of skilled tradesmen to Canada, though less spectacular, has been also very considerable, the annual total for 1924-26 having been less than a third of the figure for 1923. Meanwhile the rate of flow of skilled tradesmen to Australia, New Zealand and other parts of the British Empire was apparently untouched by the disturbing causes which affected so profoundly the volume of emigration to North America. The fact is that there has been little opening for any considerable immigration of skilled tradesmen into Australia and New Zealand, the policy of whose Governments has not tended to encourage immigration except for purposes of land settlement.

In the light of the observations made on page 15 as to the recent drift of the metal trades in Great Britain from North to South, it is of interest to note that the exceptional emigration of skilled tradesmen in these industries to North America in 1923 originated largely in Scotland. The figures in Table 11, page 256, show that the emigrants of this class from Scotland and from England and Wales during the post-war period 1921-26 have been roughly equal, but that in 1923 the number from Scotland was nearly double that from other parts of Great Britain.

The result of our analysis is to suggest that among the obstacles which hinder industrial emigration from Great Britain an important place must be given to the exclusive policy of the countries which in the past have been the main recipients of British emigrants. The experience of 1923 suggests quite clearly that a considerably larger number would be prepared to seek their fortunes in the United States if that country were ready to accept them. It is equally clear that until the policy of British overseas countries is considerably modified they can afford no alternative outlet to British industrial emigration comparable with the outlet closed by the United States. The encouragement given by British Governments both in Great Britain and overseas to schemes of Empire settlement is mainly utilised by intending settlers on the land. How important and promising for the future these schemes are may be gauged from the figures in table 9 on page 255. Settlers on the land in overseas British countries help to build up an Empire population who will be potential customers for British manufactures. All this must, in the long run, benefit employment in Great Britain, but such benefit, though real and important, will in the main be future and indirect, and land settlement overseas can make little contribution to the immediate problem of increasing the mobility of British industrial labour and promoting its more economic redistribution.

Whether in addition to the obstacles to overseas migration referred to above there may not be other hindrances to free movement arising from internal changes in our national outlook and habits of life, and perhaps in part from the operation of schemes of social amelioration, is a question which requires serious examination.

### Industrial Fluctuations.

The Memorandum on Costs of Production refers on page 87 to the prejudicial effects of fluctuating prices of materials on costs and on industry generally. Emphasis is laid on the effects of the violent oscillations which have characterised recent years in disturbing the normal relations between costs and prices and checking the healthy development of enterprise. There can be no doubt that the great uncertainty and rapid oscillations of industrial conditions which have marked the post-war period have been extremely injurious to trade and employment. While, however, there is no recent parallel

to the intensity and rapidity of movement of the "boom" of 1919-20 and the subsequent "slump," the phenomenon of periodic fluctuations of industrial prosperity is by no means a new one, dating back at least to the period following the Napoleonic wars and perhaps to still earlier years, although the imperfect statistics of the times do not permit it to be accurately traced.

The course of the economic history of the last hundred years has been largely dominated by the periodic wave movements or "trade cycles" whereby periods of good employment, rising prices, and active production have inevitably been succeeded, sometimes but not always after an acute financial crisis, by a series of lean years marked by falling prices, unemployment, and restricted activity, which in turn have eventually given place to a renewed upward movement. The characteristics, causes and effects of "cyclical" fluctuations of industry are discussed in a memorandum on page 257. As is there pointed out, traders were fully aware of the existence and importance of the cycles long before any systematic attempt was made to arrive at a scientific explanation of them. Although most of the trade representatives who gave evidence before us were mainly concerned with the special conditions of their own industry, there was a general recognition of an underlying wave movement of good and bad trade common to all industries, and (at least in later years) to all western countries, though affecting them in different degrees and not always simultaneously. While throughout the past hundred years the trade cycle has been a perfectly definite, recurrent and continuous movement, there has been no uniformity in the period or "wave length" of the cycle, which, on the contrary, has tended to diminish, until just before the war it was nearer to seven years than the ten or eleven years which was once the more usual length.

The effects of these excessive oscillations on national well-being are so injurious that no practicable remedy should be left unexplored which offers any reasonable hope of mitigating their severity. The Memorandum shows clearly that among the causes of industrial fluctuations psychological and monetary factors occupy a very important place. It is possible and even probable that physical causes also operate—some of them local and accidental (e.g. failure of crops, earthquakes or floods) some of a more general and conceivably even of a cosmical nature. But such forces as these are obviously beyond human control. The practical importance of the psychological factor lies in the fact that under modern conditions the interval between the beginning of production and the final consumption of the products is often so long that the producers are compelled to found their programme on uncertain forecasts of the market conditions which will prevail when the goods are ready for delivery. In making such forecasts there is a natural human tendency towards exaggerated optimism in times of improving

trade, and of corresponding pessimism in times of falling markets. The effects of this tendency are magnified by the action of stock-holding merchants who at the first sign of an upward movement take steps to replenish their stocks in anticipation of an increased demand from consumers, and thus increase the pressure on manufacturers and heighten the optimism of their forecasts.

The stimulus thus given to excessive production when prospects seem good becomes further intensified as the point is reached at which existing plant is insufficient to meet anticipated demands, and increased orders are placed for capital equipment. After a certain point the costs of production begin to rise faster than selling prices, and this process continues at an accelerated pace as one industry after another reaches and passes beyond the point at which, with the available personnel and equipment, it can be carried on under conditions of maximum efficiency. The point at which excessive costs put a definite check on expansion is naturally reached at different times in different industries, and the distrust thus generated spreads and becomes cumulative, until the period of over-confidence is succeeded by one of equally irrational and excessive depression.

It is impossible in this Introduction to give more than this very slight sketch of the mode in which a wave movement in industry is generated and propagated, and for further details the Memorandum on page 257 must be referred to. What has been stated, however, is sufficient to indicate the immense importance of taking all practicable steps to diminish the causes of irrational aberrations of judgment, by providing the most complete and accurate information bearing on the trend and prospects of productive activity. This is not the place for formulating definite proposals for this purpose, but reference may be made to the important recommendations already embodied in an interim report of the Committee to the President of the Board of Trade, urging the compilation of a continuous series of Indices of Production to be published at short intervals, with a view to bridging the gap between successive Censuses of Production. The Report, which has not, we believe, been previously published, is included in the present volume (*see* page 297), and the Committee are glad to know that it has been accepted by the Board of Trade and that active steps are already being taken to give effect to it.

The publication of official statistical data, however useful and indeed essential they may be, will not of course suffice to check industrial fluctuations, apart from the gradual creation of a habit of mind among the business community disposing them to take broader and longer views of their interest, based less on irrational impulse, and more on reason and experience. Such a growth is necessarily slow, and in the meantime we can only rely on better and more intelligent leadership from the relatively small number of financial, commercial and industrial concerns which command exceptional means of following the trend of the economic situation.

In the above analysis of the course of a trade cycle, nothing has been said of the influence of monetary causes. It is, however, evident that such an expansion of production and rise of prices and wages as mark the upward movement of the wave cannot take place without a greatly increased demand for currency and credit. The reaction of the banks to this increased demand must in turn have an important influence on the future form and intensity of the cyclical movement. Eventually, as prices and wages soar, a point must be reached at which the increased demand for cash for purposes of circulation will put such a strain on bank reserves as to compel restrictive action in order to protect them. But exponents of the monetary explanation of trade cycles urge that decisive and salutary action could be taken at a much earlier stage of the upward movement, if the Bank of England, in co-operation with the Central Banks of Issue in other countries, pursued a definite policy of stabilisation, through the movements of the Bank Rate and by other means. This difficult and technical subject is dealt with more fully in the Memorandum, and all that need be said here is that the closer and more continuous international co-operation among the Central Banks which is now being cautiously and informally developed through personal contact, is on all grounds to be cordially welcomed. On the other hand it is illusory to expect, either from a formal international agreement, or from any improvement in the mechanism of index numbers, an automatic remedy for industrial fluctuations. The ultimate remedy is not so much mechanical as personal, and the main hope lies in better knowledge and training and the development of a new habit of mind.

#### Official Information and Statistics.

In dealing with the causes of industrial cycles and particularly with the part played by the "psychological factor" in causing or exaggerating the oscillations, we have called attention to the important influence that might be exerted towards diminishing the intensity and mischief of these fluctuations by the provision of trustworthy data bearing on the trend of productive activity. In this connexion reference was made to the valuable steps now being taken at our instance, by the Board of Trade, to compile a continuous series of indices of production. But such a measure, important as it is, only covers a small part of the field. Broadly speaking, it is clear that the power of access on the part of manufacturers, traders and work-people to full, accurate and prompt information on trade matters is an important factor in industrial and commercial efficiency. Accordingly, with a view of preparing the ground for any recommendations which we may make hereafter on the subject of official statistics and trade intelligence, we have thought it desirable to assemble in the present volume particulars showing the range of economic and commercial information and statistics at present

published by various Government Departments, with some comparison between the present position and that which existed just before the war.

The statement as to statistics covers the Board of Trade (including the Mines Department and the Census of Production), the Ministry of Labour, the Ministry of Transport, and the Registrars General for England and Wales and for Scotland. A brief account is also given of the work of the Department of Overseas Trade which is the main authority for publishing commercial information for the use and guidance of British traders. No attempt has been made to cover the whole ground. For example, statistics of economic interest are published by the Home Office, Board of Education, Ministry of Agriculture, Ministry of Health and other Departments. The Departmental statistics, however, which are reviewed in the Memorandum on page 268, include those which are probably of the greatest direct interest to the industrial and commercial world.

It is not proposed in the present introduction to summarize the detailed information given in the Memorandum, but only to call attention to a few outstanding features.

Up to the war a process of improving the quality and extending the range of official statistics and information had been gradually and continuously in progress. Notable steps in that progress were the establishment of the Labour Department of the Board of Trade, and the commencement of the "Labour Gazette" in 1893; the formation in 1899 of the Commercial Intelligence Branch of the Board of Trade, with the "Board of Trade Journal" as its organ; and the institution of the Census of Production Office in 1906. Meanwhile a great improvement was taking place in the other branches of statistics, e.g. the Registrar-General's returns.

All this progress was brought to a standstill by the war, and during the war period official statistics were reduced to a bare minimum. Since the peace a partial revival of pre-war publications has taken place, but the opportunity has been taken to economise, by abbreviating some of these publications, issuing others at less frequent intervals and discontinuing others altogether. At the same time a Consultative Committee has been constituted including the Chief Statistical Officers of the principal Departments, which maintains a continuous survey of the whole field and ensures, so far as possible, that the necessary economies shall not unduly impair the value of official statistics for the purposes for which they are issued.

It is not here desired to anticipate any conclusions that we may eventually arrive at as to the net effect of the changes introduced. It is certain that the effect of the sudden interruption of statistical activity by the war was not wholly bad. Though the sequence was broken and the trend of progress interrupted, the enforced re-examination of the whole field of official publications was in many

respects salutary, and we have no doubt that some of the publications now suspended or discontinued had already exhausted their usefulness. The consolidation and abbreviation of certain of the other returns may present substantial advantages to busy readers, provided, of course, that essential information is not omitted ; and the publication of some of the results in the official Journals of the Board of Trade and Ministry of Labour instead of in " White Papers " has at least the merit of speed and economy, though information so published is, perhaps, likely to escape the notice of some who previously took an interest therein. Again, the establishment of the League of Nations, with its efficient and growing statistical service, has an obvious bearing on the scope of the international statistics which it is necessary and advisable for the British Government to publish separately. All these considerations must be duly weighed in arriving at a final conclusion. There is, however, one method of saving of which we desire at once to emphasise the grave disadvantages. The postponement of the date of publication can rarely, if ever, be a legitimate method of economising, since for a comparatively small saving it usually causes a very great diminution in the utility of the information to the commercial and industrial world. The essential importance of speedy publication is, perhaps, even yet not fully realised by the responsible authorities.

One of the features of war and post-war reconstruction was the establishment of a number of new Departments, including the Ministry of Labour, the Ministry of Transport, and the Department of Overseas Trade, which took over some of the statistical and intelligence functions of the Board of Trade, while the Mines Department attached to the Board of Trade became a new centre of statistical information. This multiplication of separate offices made all the more necessary the co-ordinating work of the Consultative Committee referred to above.

Quite recently a proposal to bring the existence of some of the new departments to an end has caused considerable apprehensions, in particular as regards the Department of Overseas Trade, which according to all the evidence put before us, has performed very valuable services to British trade. An account of the growth and working of this department is given on p. 288, from which it will be seen that it is erroneous to regard it as an independent department overlapping the functions of the Board of Trade and Foreign Office. On the contrary it is a joint organ of these two great parent departments established with the express object of co-ordinating their activities in the matter of Commercial Intelligence. Whatever be the constitutional form which such an organ may eventually take, we entertain no doubt as to the importance of avoiding any change which might impair its powers or usefulness, or endanger the permanence of the work of co-ordination and development which stands to its credit.

### Public Trading Enterprise.

The Memorandum on page 304, on the trading enterprise of Public Authorities, may seem at first sight to deal with a subject somewhat remote from those with which the remainder of the present volume is concerned. But a little reflection will show that a comparative examination of the results of public and private control of industrial undertakings is strictly relevant to a survey of the present industrial position. No one can doubt that loyal, competent and energetic management is one of the most important factors in industrial efficiency. So far as efficiency is affected by differences of industrial structure, e.g. the individual business, the "horizontal" or "vertical" combination or the co-operative association, the question has been examined in the preceding volume. But it has been tacitly assumed throughout that examination that the undertakings of all these different types which come under review are concerns which aim at the making of profit, including under that term the divisible surplus akin to profit which is distributed by co-operative societies among their members.

Similarly the analysis of industrial costs and of their relation to prices and profits which occupies a large part of the present volume is based on the assumption that the continued life of an undertaking depends in the long run on the making of a profit over and above the costs of production. There are, however, important enterprises conducted by Public Authorities of which this assumption is untrue. All such enterprises have behind them some kind of public guarantee whereby a deficit is made good, and they usually provide for allocating any net surplus either to the relief of rates, reduction of charges or improvement of services. For example, in 1925 the net surplus of 317 municipal gas undertakings was £247,000. But this net surplus was the difference between aggregate "profits" amounting to £538,000 made by 191 authorities and aggregate deficits of £291,000 incurred by 126 others. A sum of approximately £134,500 was contributed by 36 undertakings to the relief of rates. While naturally the manager of a public enterprise desires to show a surplus rather than a loss, neither surplus nor deficit necessarily affects the continuity of the enterprise or (except indirectly) the pockets of those in control.

In any survey of industrial enterprise carried on by Public Authorities side by side with private enterprise, we may exclude the general public services administered by local authorities such as schools, poor law institutions, libraries, baths, cemeteries, housing schemes and the like, which, though requiring efficient and business-like management, are not industrial undertakings in the ordinary sense of the term. Nor need we concern ourselves with the occasional incursions by municipalities into fields of action outside their usual scope, (e.g. dairying at Worcester, banking at Birmingham, cold storage at Wolverhampton), for such exceptional cases teach little as regards the general question of the efficiency of public enterprise.

There remain the supply of gas, water and electricity, and the management of tramways, docks and harbours. It will be observed that all these classes of undertakings have two common features ; they all deal with the supply within prescribed areas of certain articles or services of prime necessity, and they all partake more or less of the nature of monopolies. It is true that none of these enterprises exercise a legal monopoly, but (with certain exceptions that do not affect the argument) none of them can be carried on without obtaining from Parliament or from some Department of Government, compulsory powers to acquire or to pass through, over or under land in private ownership, or to break up public highways. This necessity, together with the large amount of capital necessary to establish such undertakings on an economic scale, puts them in a strong position in relation to possible competitors.

The history of gas undertakings which is told on page 305, shows that in the early stages Parliament and the public looked to the promotion of competitive undertakings as the best safeguard of the public against the results of monopoly. Experience has, however, decided conclusively against this method as wasteful and ineffective ; and since 1859, when a Parliamentary Committee investigated the subject, the policy pursued has been the allocation of areas and the subjection of the undertakings to certain conditions in the public interest as to prices, profits and quality. The growth of municipal gas enterprise is almost entirely a later development, and arose not so much from the independent establishment of municipal undertakings as from the acquisition by local authorities of companies' gasworks. This process was particularly active between 1869 and 1878, when no less than 68 gas undertakings passed into the hands of local authorities. At this time the hope was widely entertained that municipal gas enterprise might through its profits relieve the rates. On the whole, however, later experience has been against the idea of aiming at profit in municipal undertakings, and the objective of recent legislation has been the rendering of the best service at the lowest cost compatible with the avoidance of loss. After the sharp set back to gas enterprise in the early eighties, due to exaggerated fears of electrical competition, the tendency of gas supply undertakings to pass into the hands of local authorities was resumed, and 75 such cases occurred during the twenty years immediately preceding the war. In 1913 about 40 per cent. of the total gas supplied by statutory undertakings was in the hands of local authorities, and this percentage has remained practically constant since that date.

Allusion has been made to the quasi-monopolistic element present in all the chief forms of public trading enterprise. It should, however, be observed that this element varies considerably in its relative importance. It is perhaps strongest in the case of waterworks which supply an article of prime necessity for which there is no

substitute. In all other cases there is at least a possibility of competition. Gas and electricity are mutually competitive, tramways find effective rivalry in omnibuses, and every port is in competition with other ports, since the ocean highways are free to all.

The supply of electricity is, of course, a much later development than that of gas, and there was much more experience to guide the Legislature in devising methods for protecting the public. Unfortunately, zeal for safeguarding public interests led to the imposition of such drastic conditions on electricity supply companies, especially as to eventual purchase by local authorities, that the infant enterprise received a check from which it took long to recover. The figures in the Memorandum show that in 1925-26 local authorities controlled about two-thirds of the electrical supply, whether measured by the capacity of generating stations, or the amount of current sold, and that these proportions had remained approximately constant during the last five years. The statistics compiled by the Electricity Commissioners do not go back before 1920, but the Census of Production figures of electricity generated show that about the same proportion obtained so far back as 1907.

A large and increasing majority of tramway undertakings are municipally managed. Indeed, the figures given in the Memorandum indicate that company tramway enterprise is rapidly shrinking, a fact probably connected with the great development of the motor omnibus traffic, which is mostly in the hands of non-statutory companies. Another cause of the relative growth of municipal ownership is no doubt the operation of the purchase clauses to which tramway companies are subject. In 1913 about two-thirds of the route mileage of tramways and three-quarters of the cars were owned by local authorities, and by 1925 these proportions had grown to three-quarters and four-fifths respectively. The actual number of car-miles run by local authorities increased by about a quarter between 1913 and 1925, while those run by private enterprise declined in nearly the same proportion.

Both municipalities and companies have owned and operated waterworks since the earliest days of piped water supply in this country. No general powers of compulsory purchase have been given to municipalities, but in a number of important instances, e.g. London and Liverpool, company undertakings have been transferred to the municipalities. According to the Census of Production for waterworks undertakings, the municipal undertakings accounted for about four-fifths of the total "net output" in 1907, and this was still the proportion in 1924.

In the case of ports and docks the line of development has been different from that of all the above forms of public trading enterprises, as the most important ports which are publicly managed are controlled

by specially constituted port authorities or trusts, while the bulk of the remaining ports (measured by the trade passing through them) are owned by railway companies. The Memorandum on p. 333 shows that two-thirds of the whole overseas trade of the country is dealt with at ten great ports which are managed by public trusts, and about one-sixth at railway owned ports. Municipally owned ports only accounted for 2 per cent. of the trade.

The system of public trusts has grown at the expense both of municipal and company control. Thus, in 1857 the docks of Liverpool, which had been constructed and administered by the Corporation, were transferred by Act of Parliament to the newly established Mersey Docks and Harbour Board, which also took over the Birkenhead docks. More recently the Port of London Authority established under the Act of 1908 acquired the docks previously owned by three London companies. The only important port now managed by a municipality is Bristol.

One of the main reasons why management by a specially constituted authority has tended to supersede municipal control is that the area served by a great port is usually very different from the municipal area, and that the main interests concerned are the users of the port rather than the general body of ratepayers of the city in which it happens to be situated. The experience of Liverpool showed that under municipal ownership there was a tendency to give undue weight to the local interests of the city and insufficient weight to general trade considerations. Having this consideration in view the great Port Trusts are all so constituted as to ensure that the traders and shipowners who use the port shall have a predominant voice in its control. Of the members of the Port of London Authority, a clear majority are elected on a common register by the payers of dues. The same is the case in Liverpool, and the majority of the members of the Clyde Trust are chosen to represent trading and shipping interests.

There is, however, a considerable distinction to be drawn between the Port of London Authority and the other principal public Port Trusts, inasmuch as the former authority itself engages in trading operations, employing dock labour direct for the unloading of vessels, and owning and operating warehouses. The performance of these functions by the Port Authority is a legacy from the Dock Companies which were acquired in 1908. On the other hand the Mersey Board (which inherited from the Municipality) and the Clyde Trust confine themselves to the provision of facilities and leave all trading operations to private enterprise.

The Memorandum gives a considerable mass of data as to the operations of Public Authorities and Companies controlling various forms of public utility undertakings, but in most cases the information does not permit accurate comparisons to be

made between the two classes of undertakings as regards prices, profits or costs, since there is usually sufficient difference between them as regards the average size or character of the districts supplied to make such comparisons misleading. For example, most of the tramway services in great populous centres are controlled by Local Authorities, whereas inter-urban connexions are largely in the hands of Companies. Again, the electricity supply companies range from the great power companies and the Metropolitan companies with their wide areas of supply, down to a number of small undertakings at the other end of the scale, while the Local Authority areas are mostly confined to the large and moderate sized provincial towns. Moreover, any attempt to compare the financial results of the two systems is complicated by essential differences in their methods of capitalisation, and consequently in the mode of appropriation of their revenues.

While such differences tend to vitiate direct comparisons, the Memorandum furnishes useful material for those who desire to study in greater detail questions relative to the management of public utility undertakings by public and private enterprise.

The general result of the survey is to show that the trading activities of the public authorities referred to above are fairly closely limited to enterprises of the "public utility" order, which involve an element of quasi-monopoly, that within the area so circumscribed they have not lagged behind, and in some cases have out-distanced, private enterprise in the rate of progress as tested by the ordinary criteria. To this statement certain qualifications ought to be made. Where, as in electricity supply, the public interest has come to require a great enlargement of area and the amalgamation of undertakings, the resistance of local vested interests may be more harmful, because more powerful, when voiced by public authorities than by private undertakings. Where again a particular form of service tends to be superseded by an alternative form, it may be more difficult to realise the advantage of the change where the obsolescent service is in the hands of a local authority. Lastly there are forms of public utility undertakings, e.g. ports and harbours, for which direct municipal control is proved by experience to be less suited than management by a composite Public Trust representing the users of the undertakings.

#### Concluding Summary.

The aim of the present, as of the preceding volumes, is not to make recommendations, but to assemble and analyse facts and tendencies, and by so doing to narrow the range of economic controversy. Recommendations will be dealt with in our Final Report, but we are adhering to the practice we have followed since our appointment in furnishing the public, in advance of the Report, with the information which we have brought together.

A careful study of the survey of British industries which is concluded in the present volumes will probably leave a somewhat different impression on readers of different types of mind. The whole picture is so vast and complicated, and its various parts so inter-related that it is almost impossible to see it steadily and see it whole, and different observers will almost certainly differ in the weight and prominence which they attribute to each of the various aspects of the industrial situation which are here portrayed.

Some will be most impressed by the evidence afforded by the surveys of vital energy and ceaseless effort at improvement within the trades themselves. To them each industry will appear as engaged in a constant but uphill struggle to overcome by every method available the colossal difficulties of a situation not of its making, and they will interpret the limited degree of success which has so far rewarded these efforts as clear evidence that the most formidable obstacles to a full and speedy recovery of industrial health come rather from outside than from within the industry itself, in the sense that these obstacles are insurmountable by its own unaided efforts. Such observers will naturally look for effective remedies less to the trades themselves than to action by the community as a whole, whether in the form of measures of economic policy or of modifications in the general habits and way of life of the people. Some will doubtless give a prominent place to the remodelling of British commercial or fiscal policy, some to the shifting in one direction or the other of the existing frontier between public and private enterprise. Some, on the other hand, seeing little prospect of fruitful action along either of these lines, will rest their main hopes of improvement on the fuller recognition, by all classes of participants in production and distribution, of the facts that the war has made the world poorer, and that it is vain to imagine that the inhabitants of a much poorer world can live as well or as easily as before the impoverishment took place.

Other observers may interpret the same set of facts somewhat differently. They would probably agree that the only effective remedy for the industrial *malaise* from which we have been suffering is to produce at lower cost. But they would be less disposed to admit without serious qualification that the maximum effort toward the most efficient production at the lowest cost has already been made by the trades themselves, even within the limits of the economic and social conditions and standards which are unalterable by the efforts of any one industry.

Such observers would lay stress on the ground which has yet to be covered before a valid claim can be made that frank and complete co-operation has been achieved among the different classes engaged in industry for the furtherance of production and the elimination of hindrances thereto. In particular they would recall what has already been said in previous volumes, and is further emphasised in the

present surveys and memoranda, as to the prejudice caused to economic production by imperfect mobility in the widest sense of the term, and they would feel doubt whether everything possible has been done in each trade to get rid of demarcation difficulties and other obstacles to interchange and combination of effort which unduly raise productive costs.

They would give full credit to the different industries for what they have done or are attempting, in the way of interesting themselves more seriously in scientific research and industrial art, of improving their methods of training and recruitment, of eliminating waste by standardisation and other methods, or of entering into arrangements for co-operation amongst themselves which will give the advantages of large scale production and division of functions without endangering the public interest. But while recognising these efforts they would compare them, not always to the advantage of Great Britain, with the corresponding action taken by the industries of the United States and certain other countries which are our most formidable commercial competitors. And while fully recognising that the differences disclosed are partly accounted for by differences of economic circumstances and general conditions, they would still feel that British industry may have lessons to learn from its competitors as to technique, organisation, and class relations.

The present volume is not the place in which to attempt to arrive at definite conclusions on the two points of view outlined above. It may, however, be permissible to express a doubt whether they are really so antagonistic and mutually exclusive as at first sight they may appear. There is at least a great deal of common ground, and the distinction between what a trade can do for itself and what must be done for it by the action of the community is by no means a hard and fast or immutable line. It is rather a distinction of degree than of kind, and admits of many shades and varieties of co-operation between collective and individual effort.

Nor do we conceive that the usual antithesis between private and public enterprise is based on any fundamental economic principle which is valid in all circumstances and at all times. On the contrary, it is evident from what has been said above that there is a proper place and function for both these forms of management, and that the question of their relative advantages in any particular case is a practical business question, to be settled on the same principles and by the same criteria as are applied to other questions of industrial structure.

For the purpose of the present inquiry the only really fundamental cleavage is between those who, whatever may be their ultimate economic aims, start from the basis of existing conditions and endeavour to improve, or it may be to transform, these conditions, and those (a very small minority in this country) who believe that

the best service that can be rendered to humanity is to make the present economic organisation unworkable, and thus to hasten the day when it shall be superseded by some other structure. The difference is fundamental, because there can be no common measure between proposals aimed at the improvement of society and those aimed at its dissolution.

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In compiling these volumes we have drawn freely on evidence received from trade organisations (manufacturers' and employers' organisations, trade unions, etc.) and from individuals; we have also sought the co-operation of such organisations and individuals in special investigations. Invaluable information was derived from these sources, and we tender our cordial thanks to all concerned. We may perhaps make special reference to those who have furnished data for publication on the important subject of costs of production and distribution, and to the Accountant who prepared the memorandum on Over-capitalisation included in the present volume. Once again we have to express our gratitude for the information put at our disposal by Government Departments, in particular, on this occasion, by the Treasury, the Board of Trade, the Mines Department, the Department of Overseas Trade, the Ministry of Labour, the Ministry of Transport, the Electricity Commissioners, and the General Register Offices. We also wish to thank the Stationery Office for the efficiency and energy they have shown in all matters connected with the printing and publication of each of our volumes. We are specially indebted to the Board of Trade and the Comptroller and Auditor General who kindly lent the services of specially qualified officers to assist our Secretariat in the preparation of the surveys of industries and certain other memoranda which appear in these volumes. We cordially acknowledge the valuable work done by these officers.

Finally, as the present volumes complete the first stage of our inquiry, viz. the presentation of the facts in regard to industry and trade, we desire before passing to our final report to express our very high appreciation of the invaluable services of our Secretary, Mr. Walter Carter, of the Board of Trade, of the two Assistant Secretaries, Mr. A. R. Fraser, of the Department of Overseas Trade, and Mr. W. L. Buxton, of the Ministry of Labour, and of the small but efficient clerical staff who have worked under their direction.

December, 1927.

### Preliminary Notes.

1. *Date.* The question of the latest date for which information should be given in the Memoranda contained in the present and the two following volumes has presented a certain amount of difficulty, particularly in the Surveys of individual industries. Owing to the abnormal conditions which prevailed in Great Britain in 1926 as the result of the General Strike and the Coal Stoppage, the figures of British production and trade for that year (particularly in the coal, iron and steel and engineering industries) have little value for comparison either with the earlier post-war years or with the years immediately preceding the war. Hence, where it is desired (as, for example, in comparisons between pre-war and post-war conditions in the metal industries) to quote statistics for a number of consecutive post-war years, the figures have generally not been carried beyond 1925. The statistics for 1927 are not yet published in full detail, but they have been inserted in the Surveys so far as available. The position varies somewhat in the different industries surveyed, and an explanation of the method adopted in each case will be found in the relevant Survey.

2. *Comparisons with Pre-war Conditions.* The following note appeared in the "Survey of Overseas Markets" and in the "Survey of Industrial Relations," and is reproduced here as being applicable.—

"The comparisons of post-war with pre-war conditions which appear so frequently throughout the volumes are not to be taken as necessarily implying that pre-war conditions are regarded as a standard to which it is probable or desirable that post-war conditions should approximate. Pre-war conditions are, however, generally recognised as a convenient datum line for comparisons, and it is from this point of view that they have been used in these volumes."

## CHAPTER I.

### THIRD CENSUS OF PRODUCTION, 1924.

#### ANALYSIS OF THE PRELIMINARY REPORTS NUMBERS 1 TO 25, TOGETHER WITH THE REPORT ON THE WOOLLEN AND WORSTED INDUSTRY.

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## THIRD CENSUS OF PRODUCTION, 1924.

ANALYSIS OF THE PRELIMINARY REPORTS NUMBER 1 TO 25,  
TOGETHER WITH THE REPORT ON THE WOOLLEN  
AND WORSTED INDUSTRY.**Object and Scope of Analysis.**

The object of this memorandum (which has been prepared for the Committee on Industry and Trade by one of their members) is to analyse under certain headings the results of the Third Census of Production in the industries covered by the Preliminary Reports No. 1 to 25 (published in the "Board of Trade Journal" up to 13th October, 1927), together with the woollen and worsted industry (Preliminary Report No. 29).

The memorandum covers 90 industries and in some instances, in addition, separate branches in those industries; e.g. in the Engineering Trade, the Electrical, Marine, Prime Movers, Textile Machinery, Machine Tools and Heating Branches are dealt with separately. A complete list of the industries included in the analysis will be found in Appendix II, Table 1, p. 60. For the purposes of the analysis the industries have been grouped under the headings used in the Census of Population Returns. (See Appendix I, Note A, p. 57.) These headings have already been used in a former volume (see "Survey of Industrial Relations," Population, p. 403), and it has, therefore, been considered convenient to adopt them for the present purpose.

The industries covered by the analysis include a number of the important industries comprised in Group III (Mining), and Groups IV to XIV (Manufacturing),\* and they cover a considerable proportion of the total number of persons shown by the Census of Population as engaged in such groups. The more important of the industries not included in the analysis are Heavy Chemicals in Group V, Tailoring and Dressmaking in Group IX, and Joinery, Carpentry and Furniture Making in Group XI. Of these only the first named is of substantial importance from the point of view of the great exporting trades.

The Preliminary Reports No. 1 to 25 also include the Gas, Water and Electricity Undertakings comprised in Group XV, and, so far as the work of construction, repair and renewal is concerned, the Canal, Dock, Harbour, Tramway and Light Railway Undertakings comprised in Group XVI. In dealing with these undertakings the Preliminary Reports distinguish between those carried on by local authorities and by companies; and in the undertakings carried on by local authorities, they include constructional work on buildings,

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\* None of the trades included in Group XIII (Building, Contracting, etc.) have been dealt with in the Preliminary Reports No. 1 to 25.

highways, bridges and sewage works. Some of the persons employed in these last-mentioned undertakings are included in Group XVIII, and it is, therefore, not possible to compare the total number of persons employed in undertakings (as distinguished from industries) covered by the Census of Production Reports with the total number of persons engaged in the group as shown by the Census of Population Returns; but the figures that are given in the Reports are included in this analysis.

The Preliminary Reports also include the Laundry, Cleaning, etc., Trade, which, in the Population Census Returns, is included in Group XXI (Personal Service). It is somewhat difficult to appreciate the reasons why this trade was distinguished in the Population Census Returns from some of the other industries dealt with in Groups IV to XIV, but, as the distinction has been made, such figures as are given in this analysis in regard to the Laundry, Cleaning, etc., Trade are shown separately.

As is pointed out in the Census of Production Reports, in most of the industries dealt with no single and direct comparison is possible between the First Census (1907) and the Third Census (1924), whilst the figures of the Second Census (1912) are available for only some of the industries. But some comparisons are made in the Census of Production Reports, and these are summarised below. The points upon which comparisons are made, but subject in many instances to reservations and qualifications,\* are as regards (1) number of persons employed, (2) power available, and (3) production.

The detailed particulars under the above headings relating to each of the industries, etc., dealt with in this memorandum (i.e. those covered by the Census of Production Preliminary Reports No. 1 to 25, together with the Woollen and Worsted Industry from Report No. 29) are set out in Table 1, Appendix II (p. 60). The industries, etc., are arranged in groups, as explained above, and the table shows the totals for each group under the various headings. These group totals are brought together and aggregated into further totals in Table 2, p. 66.

#### Number of Persons Employed.

The figures given in the Census of Production Reports appear (subject to minor qualifications) to afford a basis of comparison between the numbers employed in the years 1907 and 1924. For

\* One general qualification is that whereas the figures for 1924, given in the table, relate exclusively to Great Britain, in some of the industries included the figures for 1907 relate to the whole of the United Kingdom. The inclusion of Ireland in the figures for the earlier years does not substantially affect their comparability with those for 1924, except in the case of shipbuilding and marine engineering. The value of the gross output of shipbuilding yards and of marine engineering workshops in Northern Ireland in 1924 was in each case about one-sixteenth of the gross output from similar yards and workshops in Great Britain.

the industries and undertakings dealt with in the Reports covered by this memorandum, the numbers are as under in each of the groups:—

Census of Population Group Heading.	Average Numbers employed* in the Industries, etc., comprised in the Census of Production Reports No. 1 to 25, together with the Woollen and Worsted Industry (from Report No. 29).		Percentage Increase or Decrease shown by the figures for 1924 on those for 1907.	
	1907.	1924.	Increase	Decrease.
<i>Industries.</i>				
III.—Mining and Quarrying ..	('000). 865·0	('000.) 1,208·8	Per cent. 40	Per cent. —
IV.—Bricks, Pottery, Glass ..	136·3	137·5	1	—
V.—Chemicals, Dyes, Paints, etc.	61·2	77·0	26	—
VI.—Metals, Machines, Implements, Conveyances.	1,500·3	1,801·1	20	—
VII.—Textiles .. .. ..	1,171·1	1,151·0	—	1·7
VIII.—Skins and Leather ..	53·0	54·3	2	—
IX.—Clothing .. ..	162·5	183·3	13	—
X.—Food, Drink, Tobacco ..	280·6	338·8	21	—
XI.—Woodworking, etc. n.	20·8	20·2	—	3
XII.—Papermaking, Printing, Bookbinding	308·3	346·2	12	—
XIV.—Other Manufacturing Industries.	101·2	144·9	43	—
Total, IV—XIV ..	3,795·3	4,254·3	12	—
Total Industries dealt with in Preliminary Reports No 1 to 25, together with Report on Woollen and Worsted Industry.	4,660·3	5,463·1	17	—
<i>Undertakings.</i>				
XV & XVI.—Gas, Electricity and Water; and Construction, Repairs, etc., of Canals, Docks, Tramways and Light Railways	293·4	385·8	31	—
<i>Personal Service</i>				
XXI.—Laundry, Cleaning, etc...	126·6	118·3	—	6·5
Grand Total dealt with in Reports No. 1 to 25, together with Report on Woollen and Worsted Industry	5,080·3	5,967·2	17	—

\* The "average number of persons employed" is the mean of the numbers actually at work on each of four given days—one in each quarter—in 1907, and in each of twelve given weeks—one in each month—in 1924. Persons engaged in an industry, but, in fact, not actually *employed* at the given dates, are not included.

NOTE.—The percentage changes shown in the above table relating to numbers employed may be compared with those given in Appendix I, Note B, p. 57, which are based on the Census of Population Returns, and, therefore, include all persons "engaged" in the several groups.

For the purpose of attaching appropriate weight to the figures given in the tables that follow, it is convenient to consider the above figures for each of the groups of industries, for both years, as percentages on the total number of persons employed in all the industries dealt with in the reports covered by this memorandum. These percentages are as follows :—

Census of Population Group Heading,	Percentage on total number of Persons employed* in the Industries dealt with in Census of Production Reports No. 1 to 25, together with the Woollen and Worsted Industry.	
	1907.	1924.
	Per cent.	Per cent
III.—Mining and Quarrying .. ..	18.5	22.1
IV.—Bricks, Pottery, Glass .. ..	2.9	2.5
V.—Chemicals, Dyes, Paints, etc. ..	1.3	1.4
VI.—Metals, Machines, Implements, Con- veyances	32.2	33.0
VII.—Textiles .. .. ..	25.3	21.0
VIII.—Skins and Leather .. .. ..	1.1	1.0
IX.—Clothing .. .. ..	3.5	3.4
X.—Food, Drink, Tobacco .. .. ..	6.0	6.2
XI.—Woodworking, etc. .. .. ..	0.4	0.4
XII.—Papermaking, Printing, Bookbinding	6.6	6.3
XIV.—Other Manufacturing Industries ..	2.2	2.7
Total IV—XIV .. .. ..	81.5	77.9
Total in the Industries dealt with in Preliminary Reports No. 1 to 25, together with the Woollen and Worsted Industry.	100.0	100.0

\* See footnote, page 48.

### Power Available.

The figures given in the Census of Production Reports appear to afford a basis of comparison between the years 1907 and 1924 in regard to the available horse-power of the engines in the works—steam (both reciprocating and turbine), internal combustion and other power. As to electric motors, the returns distinguish between those actuated by (1) power generated by engines in the works, and (2) purchased electricity. The power of the motors included in (1) represents a method in which power generated by the engines in the works is being applied and is, therefore, not an addition to such last-mentioned power. The power of the motors included in (2) is, speaking generally, an addition to the horse-power of the steam and other power engines as recorded in both years, but the extent to which motors actuated by purchased electricity were used in 1907 appears

to have been negligible compared with the total engine power in industry as a whole, though no doubt the position varied considerably as between different industries. The great addition to the power of motors included in (2) appears to have been made after 1912.

The following table therefore shows, for 1907, only the available horse-power of the *engines in the works*, and for 1924 the available horse-power both of the engines in the works and of the motors actuated by purchased electricity.

Census of Population Group Heading	Horse-power available in the Industries etc comprised in the Census of Production Reports No. 1 to 25 and the Woollen and Worsted Industry.	
	Engines in Works.	Engines in Works and motors actuated by purchased electricity
	1907.	1924.
<i>Industries.</i>		
III.—Mining and Quarrying .. .. ..	('000.) 2,358·6	('000.) 4,128·7
IV.—Bricks, Pottery, Glass .. .. ..	161·8	206·4
V.—Chemicals, Dyes, Paints, etc. .. ..	64·6	145·5
VI.—Metals, Machines, Implements, Conveyances.	2,402·0	5,268·2
VII.—Textiles .. .. .. ..	1,909·2	2,605·2
VIII.—Skins and Leather .. .. .. ..	25·3	82·6
IX.—Clothing .. .. .. ..	25·8	77·3
X.—Food, Drink, Tobacco .. .. .. ..	313·5	607·8
XI.—Woodworking, etc. .. .. .. ..	12·0	30·8
XII.—Papermaking, Printing, Bookbinding ..	232·5	472·7
XIV.—Other Manufacturing Industries ..	80·7	234·9
Total IV—XIV .. .. .. ..	5,227·4	9,731·4
Total Industries dealt with in Preliminary Reports, No. 1 to 25, together with Woollen and Worsted Industry	7,586·0	13,860·1
<i>Undertakings.</i>		
XV & XVI —Gas, Electricity and Water; and Construction, Repairs, etc., of Canals, Docks, Tramways and Light Railways.	1,931·3	5,961·7
<i>Personal Service</i>		
XXI —Laundry, Cleaning, etc. .. .. ..	37·3	62·4
Grand Total dealt with in Reports No. 1 to 25, together with Report on Woollen and Worsted Industry.	9,554·6	19,884·2

The average available horse-power per head of the persons employed in the industries and undertakings dealt with in the Census of Production Reports covered by this memorandum was as under :—

Census of Population Group Heading.	Horse-power per Head of Persons Employed in the Industries, etc., comprised in the Census of Production Reports No. 1 to 25, and the Woollen and Worsted Industry.		Percentage increase shown by the figures for 1924 on those for 1907.
	1907.	1924.	
<i>Industries.</i>			
III.—Mining and Quarrying ..	H.P. 2.73	H.P. 3.42	Per cent 25
IV.—Bricks, Pottery, Glass ..	1.19	1.50	26
V.—Chemicals, Dyes, Paints, etc.	1.06	1.89	78
VI.—Metals, Machines, Implements, Conveyances.	1.60	2.93	83
VII.—Textiles .. .. ..	1.63	2.26	39
VIII.—Skins and Leather .. ..	0.48	1.52	217
IX.—Clothing .. .. ..	0.16	0.42	162
X.—Food, Drink, Tobacco ..	1.12	1.79	60
XI.—Woodworking, etc. .. ..	0.58	1.52	162
XII.—Papermaking, Printing, Bookbinding.	0.75	1.37	83
XIV.—Other Manufacturing Industries.	0.79	1.62	105
Total IV—XIV .. ..	1.38	2.29	66
Total Industries dealt with in Preliminary Reports No 1 to 25, together with Woollen and Worsted Industry.	1.63	2.54	56
<i>Undertakings.</i>			
XV & XVI.—Gas, Electricity and Water; and Construction, Repair, etc., of Canals, Docks, Tramways and Light Railways	6.58	15.45	135
<i>Personal Service</i>			
XXI.—Laundry, Cleaning, etc. ..	0.29	0.53	83
Grand Total dealt with in Reports No. 1 to 25, together with Report on Woollen and Worsted Industry.	1.8	3.3	83

### Production.

As regards production, the particulars given of gross output either in value or volume appear to be of small importance in comparing the position of most of the industries in 1907 and 1924. In some, as, for example, those in Group III, the cost of materials purchased and used and the amount paid for work given out forms a small percentage of the value of the gross output value (e.g. in coal mining it is 16 per cent.), but even in that group there are industries in which such percentage is large (e.g. in coke and bye-products it is 79 per cent.). In all the other industries the percentage is considerable, ranging from 88 per cent. in grain milling to 23 per cent. in the type-founding, engraving, and die-sinking trade.

The Census of Production Reports give the net output value in 1924 of each of the 90 industries with which this memorandum deals, i.e. the gross output value less the cost of the materials purchased and used, and the amount paid for work given out. In addition the Reports give the net output value in 1907 per head of those employed (as well as the total numbers employed) in 84 of such industries\*; and similar figures for 1912 in 32 of such industries.

From such information as is available it is clear that the increase in net output value was small between 1907 and 1912. In the 32 industries for which the figures for 1907, 1912 and 1924 are given (and in which industries about 1,650,000 persons were engaged in 1907 and about 1,800,000 persons in both 1912 and 1924), the net output value per head of those employed increased from £86 to £93, or by 8 per cent., between 1907 and 1912, and from £93 to £209, or by 125 per cent., between 1912 and 1924. (See Appendix I, Note D, p. 59.)

The values given in the Census of Production Reports are affected by the advances in prices that have occurred since 1907. The Board of Trade General Index Number of Wholesale Prices for the material years is as follows, if the figure for 1907 be taken as 100:—

1907	..	..	..	..	100
1912	..	..	..	..	108.7
1924	..	..	..	..	183.2

But the General Index Number of the year cannot be applied to each of the particular industries dealt with in this memorandum for example, in coal mining the Census of Production Reports show that the net output value in 1924 was 97 per cent. above that of 1907, but that the actual weight of coal raised was practically identical, i.e. 268 million tons in 1907, as against 267 million tons in 1924.

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<sup>1</sup> Figures cannot be ascertained in the remaining six cases as these relate either to new industries or to industries which (as compared with 1907) have been subdivided for the purpose of the later Census. A list of the six cases in question is given in Appendix I, Note C, page 58.

The following is a comparison based on such figures as are given of the net output value per head in 1907 and 1924 in the 84 industries referred to above. For comparative purposes the figures relating to Groups XV and XVI and Group XXI are added to the table.

*Value of net output per head.*

Census of Population Group Heading	Net Output per Head in the Industries, etc., comprised in the Census of Production Reports No. 1 to 25*, and the Woollen and Worsted Industry.		Percentage in- crease shown by the figures for 1924 on those for 1907.
	1907	1924.	
<i>Industries.</i>			
III.—Mining and Quarrying ..	£ 129	£ 182	Per cent. 41
IV.—Bricks, Pottery, Glass ..	73	182	150
V.—Chemicals, Dyes, Paints, etc.	168	386	130
VI.—Metals, Machines, Implements, Conveyances.	100	188	88
VII.—Textiles .. ..	78	178	128
VIII.—Skins and Leather .. ..	96	233	143
IX.—Clothing .. ..	70	171	144
X.—Food, Drink, Tobacco ..	190	387	104
XI.—Woodworking, etc. .. ..	87	189	117
XII.—Papermaking, Printing, Book- binding.	103	268	160
XIV.—Other Manufacturing Indus- tries.	100	238	138
Total IV—XIV .. ..	99	213	115
Total Industries dealt with in Pre- liminary Reports No. 1 to 25*, together with Woollen and Worsted Industry.	105	206	96
<i>Undertakings.</i>			
XV & XVI.—Gas, Electricity and Water; and Con- struction, Repairs, etc., of Canals, Docks, Tramways and Light Railways.	146	259	77
<i>Personal Service.</i>			
XXI.—Laundry, Cleaning, etc. ..	55	136	145

\* Excluding the six industries for which particulars are not available.

The variations in the value of the net output per head in the 84 industries referred to above are very wide, as is shown by the following summary relating to the years 1907 and 1924.

Heading according to Value of Net Output per Head of Persons employed.						Number of Industries falling under each Heading	
	£	£	1907.	1924.			
Between	50-100	..	..	..	..	40	—
..	101-150	..	..	..	..	23	7
..	151-200	..	..	..	..	14	30
..	201-250	..	..	..	..	2	16
..	251-300	..	..	..	..	2	8
..	301-350	..	..	..	..	1	7
Over	350	..	..	..	..	2	16
						84	84

The variations in the rate of increase between 1907 and 1924 in the value of the net output per head in the industries are not so wide. There is a decrease shown in only one of the industries, viz. coke and by-products from £274 in 1907 to £270 in 1924. In two industries, viz. sugar and artificial flowers, the figures given do not enable the percentage increase per head to be stated.\* In the remaining 81 of the 84 industries the position as regards rate of increase may be summarised as follows :—

Heading according to Percentage Increase shown by the figures for 1924 on those for 1907.						Number of Industries falling under each Heading.	
Increase under 50 per cent.	..	..	..	..	..	5	
..	between 51- 75 per cent	..	..	..	..	6	
..	..	76-100	..	..	..	8	
..	..	101-150	..	..	..	42	
..	..	151-200	..	..	..	15	
..	..	200-300	..	..	..	4	
..	over	300	..	..	..	1	
						81	

### Summary.

In the following table the figures relating to the industries and undertakings dealt with in this memorandum are collected

\* In the case of Sugar, the alterations in Duties make direct comparisons between 1907 and 1924 misleading. In the case of Artificial Flowers, the returns made in 1907 proved defective.

*Industries and undertakings dealt with in the Census of Production Preliminary Reports No. 1 to 25, together with the Woollen and Worsted Industry.*

Census of Population Group Heading.	Numbers employed* in 1924 as percentage on numbers employed* in all the Industries dealt with in Reports No. 1 to 25, together with the Woollen and Worsted Industry.	Percentage increases between 1907 and 1924.			
		Number of persons employed.*	Power available.		Net Output Value per head of Persons employed.*
			Total H.P.	Average H.P. per head of Persons employed.*	
		%	%	%	%
<i>Industries.</i>					
III.—Mining and Quarrying.	22.1	40	75	25	41
IV.—Bricks, Pottery, Glass.	2.5	1	27	26	150
V—Chemicals, Dyes, Paints, etc.	1.4	26	125	78	130
VI.—Metals, Machines, Implements, Conveyances.	33.0	20	119	83	88
VII.—Textiles ..	21.0	—1.7	36	39	128
VIII.—Skins and Leather	1.0	2	226	217	143
IX.—Clothing ..	3.4	13	199	162	144
X.—Food, Drink, Tobacco.	6.2	21	94	60	104
XI.—Woodworking, etc.	0.4	—3	157	162	117
XII.—Papermaking, Printing, Book-binding.	6.3	12	103	83	160
XIV—Other Manufacturing Industries.	2.7	43	191	105	138
Total IV—XIV	77.9	12	86	66	115
Total Industries dealt with in Preliminary Reports No. 1 to 25, together with the Woollen and Worsted Industry.	100	17	83	56	96

\* The numbers employed represent only the persons employed in the industries and undertakings dealt with in the Census of Production Preliminary Reports No. 1 to 25, together with the Woollen and Worsted Industry from Report No. 29.

(Summary Table—continued.)

Census of Population Group Heading	Numbers employed* in 1924 as percentage on numbers em- ployed* in all the Industries dealt with in Reports No. 1 to 25, together with the Woollen and Worsted Industry	Percentage increases between 1907 and 1924.				
		Number of persons em- ployed.*	Power available		Average H.P. per head of Persons em- ployed*.	Net Output Value per head of Persons em- ployed.*
			%	%	%	%
<i>Undertakings.</i>						
XV & XVI.—Gas, Elec- tricity and Water, and Construction, Repairs, etc., of Canals, Docks, Tramways and Light Railways.	—	31	209	135	77	
<i>Personal Services.</i>						
XXI.—Laundry, Clean- ing, etc	—	—6·5	67	83	145	

\* See footnote, p. 55.

## APPENDIX I.

## NOTE A.

The total number of persons shown by the Census of Population as "engaged" in 1921 in all the trades comprised in Groups III to XIV (excluding Group XIII, Building, Contracting, etc.) was 8,240,000, but this total requires adjustment in two respects before it can be compared with the numbers recorded in the Census of Production. In the first place the total included all persons following an industry whether as employers or employees, and whether employed or unemployed. On the other hand, the numbers shown by the Census of Production, being the mean of the numbers actually employed in given weeks during 1924, exclude not only employers but also persons "engaged" but not actually employed at the given dates. In the second place, the Census of Population figures relate to 1921 and the Census of Production figures to 1924, and between these two dates there was an increase in the total number of persons engaged in industry in consequence of the growth in the population. In the absence of data for making an exact adjustment it may be assumed that a reduction of 15 per cent. in the Census of Population figures would render them roughly comparable in total with those of the Census of Production. The Census of Population figures will then be reduced from 8,240,000 to 7,004,000, whilst the number of persons shown by the Preliminary Reports of the Census of Production as employed in 1924 in the industries dealt with in Reports No. 1 to 25, together with the Woollen and Worsted Industry, was 5,463,100, or 78 per cent. of the total employed in all the groups concerned. It is not possible to make similar calculations for each of the 11 groups, but it appears from the available data that for six of the groups, including the three largest, the corresponding percentage is over 80, and for three of the remaining groups over 40. In only one case (Group XI) is the percentage under 10.

## NOTE B.

The Census of Population Returns (dealt with in the "Survey of Industrial Relations," Table 5, p. 416), show for Great Britain:—

*Total Occupied Population.*

Year.	Number.	Increase per cent. over total at previous census.
1901 .. .. ..	16,312,000	12
1911 .. .. ..	18,354,000	13
1921 .. .. ..	19,357,000	5

They also show for England and Wales (Table 6, p. 418) the following as percentage increases or decreases in the total numbers "engaged" in each group.

Group.	Inter-Censal Increase or Decrease per cent					
	1891-1901.		1901-11.		1911-21.	
	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
III.—Mining and Quarrying..	% 26	% —	% 30	% —	% 14	% —
IV.—Bricks, Pottery, Glass..	24	—	—	2	—	—
V.—Chemicals, Dyes, Paints, etc.	43	—	43	—	49	—
VI.—Metals, Machines, Imple- ments, Conveyances	31	—	22	—	40	—
VII.—Textiles .. ..	—	6	13	—	—	3
VIII.—Skins and Leather ..	8	—	5	—	—	7
IX.—Clothing .. ..	—	—	2	—	—	22
X.—Food, Drink, Tobacco..	—	—	40*	—	13	—
XI.—Woodworking, etc. ..	—	—	7	—	—	6
XII.—Papermaking, Printing, Bookbinding.	—	—	24	—	19	—
XIII.—Building, Contracting ..	—	—	—	9	—	12
XIV.—Other Manufacturing In- dustries.	—	—	30*	—	45	—
Total IV-XIV ..	—	—	11*	—	7	—

\* Estimated for the purposes of this memorandum.

#### NOTE C.

The following are the industries for which comparative figures as to net output value per head of the persons employed in 1907 are not available:—

Number in detailed Table (p. 60).	Industry.	Persons employed in 1924 ('000).
13 .. ..	Blast Furnaces .. ..	26.8
29 .. ..	Hardware .. ..	72.4
58 .. ..	Preserved Meat, etc. .. ..	35.0
66 .. ..	Fish Curing .. ..	9.7
83 .. ..	Packing .. ..	8.0
90 .. ..	Film Printing .. ..	0.6
		152.5

## NOTE D.

*Comparison of net output value per head in 1907, 1912, and 1924.*

\* An increase in the net output value per head in 1912 (as compared with 1907) is shown in most of the industries for which the figures are given, but it was small as compared with the increase between 1907 and 1924. The following are the figures given for the three years —

Group.	Net Output Value per Head of Persons Employed.		
	1907.	1912.	1924.
V.—Ink, Gum and Sealing Wax .. ..	272	289	472
Starch, Blue and Polish .. ..	174	190	418
VI.—Wire .. .. ..	116	120	242
Motor and Cycle .. .. ..	109	109	226
Needle, etc .. .. ..	64	70	140
VII.—Cotton Spinning and Weaving .. ..	79	81	159
Woollen and Worsted .. ..	71	82	187
Silk and Artificial Silk .. ..	55	72	255
Jute, Hemp, Linen .. ..	62	71	140
Hosiery .. ..	61	68	159
Rope, Twine and Net .. ..	81	81	169
Canvas Goods and Sacks .. ..	68	87	195
Elastic Webbing .. ..	68	72	155
Engine and Boiler Packing and Asbestos ..	139	166	322
Bleaching, Dyeing, Printing, Finishing ..	109	109	251
Lace .. ..	90	93	163
IX.—Glove Making .. ..	91	85	186
Bacon Curing and Sausage .. ..	162	178	337
Cattle, Dog and Poultry Food .. ..	156	149	387
Aerated Waters, etc .. ..	125	131	316
XII.—Paper .. .. ..	111	126	253
Wall Paper .. .. ..	182	142	340
Cardboard Box .. .. ..	52	61	153
Pens, Pencils, etc. .. .. ..	77	81	177
Printing and Bookbinding .. ..	88	96	213
Printing and Publication of Newspapers ..	190	221	547
XIV.—Musical Instruments .. ..	105	128	222
Linoleum and Oilcloth .. ..	108	230	426
Billiard Table and Sports Requisites .. ..	101	118	236
Games and Toys .. ..	58	66	138
Artificial Flowers .. ..	63	67	127
Coconut Fibre and Horsehair .. ..	68	78	196
Total in the Industries for which the Net Output Value per head is given for the years 1907, 1912 and 1924.	86	93	209

Summary of particulars relating to 90 industries and to certain public Reports Nos. 1 to 25, together with the Report on the Woollen Census of

TABLE 1. DETAILED

Serial No.	Group.	Description of Trades*	Persons Employed*	Power Available *			
				Total		Per Head Persons Employed	
			Number, '000 1907.	1924	H.P. '000 1907.	1924.	H.P. 1907.
1	III	<i>Mining and Quarrying</i> —					INDUS
2		Coal Mining	837 8	1,175 7	2,293 2	3,879 7	2.74 3.30
3		Coke and By-products	10 9	18 5	—	126.8	— 6.85
4		Manufactured Fuel	1 5	1 7	5 3	10 1	3 53 5.94
		Cement	14 8	12 9	60 1	112 1	4 06 8.69
		Total III ..	865 0	1,208 8	2,358 6	4,128 7	2 73 3.42
5	IV	<i>Bricks, Pottery, Glass</i> —					
6		Brick and Fire Clay	68 1	68.3	135 8	163 4	1 99 2.39
		China and Earthenware	68.2	69 2	26 0	43 0	0 38 0.62
		Total IV ..	136 3	137.5	161 8	206 4	1 19 1.50
7	V	<i>Chemicals, Dyes, Paints, etc</i> —					
8		Paints, Colour and Varnish	13 8	18 7	14 6	37 6	1 06 2.01
9		Fertilisers, Sheep Dips, Disinfectants	11 2	10 3	20.1	35.9	1 79 3.49
10		Soap and Candle	18 7	27 6	16 9	44 3	0 90 1.60
11		Match	4 2	5 1	1.6	6 0	0 38 1.18
12		Ink, Gum, Sealing Wax	1 7	3.6	2 1	6.5	1 24 1.81
		Starch, Blue, Polish	11 6	11 7	9 3	15 2	0 80 1.30
		Total V ..	61 2	77 0	64 6	145 5	1 06 1.89
13	VI	<i>Metals, Machines, Implements, Conveyances</i> —					
14		Blast Furnaces	—	26 8†	—	474 2‡	—
15		Rolling, Smelting and Founding	261 1	250 3	1,883 3	2,290 4‡	5 30 9.15
16		Wrought Iron and Steel Tube	20.2	24 3	23 0	97.0	1 14 3.99
17		Tapplate	20 6	28 0	68.9	106 5	3.34 3.80
18		Wire	18 3	25.0	31 0	92 0	1 69 3.68
19		Blacksmithing	20 7	17.0	4.0	8 4	0 19 0.49
		Engineering	455 0	587.8	327 9	1,120 9	0 72 1.91
		Electrical	—	156.5	—	157.2	— 1.00
		Marine	—	59.7	—	254 4	— 4.27
		Prime Movers	—	79.2	—	179.7	— 2.27
		Textile Machinery	—	60.8	—	81 6	— 1.34
		Machine Tools	—	9.7	—	26 5	— 2.73
		Heating, etc.	—	47.6	—	35 3	— 0.74
20		Railway Carriage	28.9	28 3	30 4	64 8	1 05 2.29
21		Motor and Cycle	53 6	200 3	15 3	194 1	0 28 0.97
22		Railway Works (of Railway Companies)	229 9	249 4	267.7	375 5	1 16 1.51
23		Needle, etc	13 2	12 1	3 3	7.4	0.25 0.61
24		Tools, Implement	23 6	28 1	19 0	61 9	0 80 2.20
25		Cutlery	14 8	11 4	5 2	13 4	0 35 1.17
26		Small Arms	4 9	2 5	2 6	3 1	0 53 1.24
27		Type	6 5	9 7	0 7	3 6	0 11 0.37
28		Shipbuilding	188 3	176.5	114 6	538 6	0 61 3.05
29		Hardware, Hollow-ware, Bedsteads	—	72 4‡	—	57 8‡	— 0.80
30		Anchor Chain, Nail, Bolt, Nut, Screw, Rivet	28 0	33 6	23 0	50 2	0 82 1.49
31		Copper and Brass, Smelting, Rolling, Casting	21 3	25 3	43 8	92 2	2 06 3.64
32		Other Non-ferrous Metals, Rolling, Casting	9 3	20 5	18 5	100 0	1 99 4.88
33		Finished Brass	38 6	33 2	12 8	26 5	0 33 0.80
34		Watch and Clock Making	5 3	4.3	0 5	1 0	0 09 0.23
35		Jewellery, Gold, Silver, Electro Plate	38 2	33 5	6 5	20 7	0 17 0.62
		Total VI ..	1,500.3	1,900 3	2,402 0	5,800 2	1 60 2.93
		† Deduct figures not comparable.	—	99 2	—	532 0	—
			—	1,801 1	—	5,268 2	—

\* The trades and undertakings dealt with in this statement are only those included in the Census of

undertakings, etc., prepared from the Census of Production Preliminary and Worsted Industry, and arranged in the groups used in the population

PARTICULARS.

Gross Output (Value) *	Net Output (Value) *					Percentage Increase or Decrease of Figures for 1924 on those for 1907					Serial Nos.	
	Total Value		Value per Head Persons Employed			Persons Employed	Power available Total.	Power available per Head	Net Output Value	Net Output Value per Head		
	£'000 1924	£'000 1907	1907	1912	1924							
TRIES												
250,306	106,399	209,820	127	—	178	40	69	21	97	40	84	
24,389	2,991	5,001	274	—	270	70	—	68	67	—	21	
1,774	267	401	178	—	236	13	91	50	33	—	23	
7,651	1,956	4,679	132	—	363	13	87	114	139	175	61	
—	111,613	219,901	129	—	182	40	75	25	97	41	77	
20,621	5,315	14,267	78	—	209	0 3	20 0	20 0	168	168	69	
17,421	4,635	10,808	68	—	156	1 5	65 0	63 0	133	129	62	
—	9,950	25,075	73	—	182	1 0	27 5	26 0	152	150	66	
17,062	2,740	7,739	198	—	414	35 0	157	90	182	109	45	
7,982	1,721	2,340	154	—	227	— 8 0	79	95	36	47	29	
30,626	2,901	11,335	155	—	411	47 0	•162	78	291	165	37	
2,653†	408	1,725†	97	—	339†	21 0	275	211	323	250	65	
3,132	468	1,700	272	289	472	112 0	210	46	267	74	54	
9,805	2,021	4,891	174	190	418	0 9	63	62	142	140	53	
—	10,254	29,733	168	—	386	26 0	125	78	190	130	42	
86,389	—	5,172‡	—	—	193	—	—	—	—	—	—	
149,622	30,025	44,175	115	—	176	— 4 0	65	73	47	53	30	
13,446	2,184	5,245	108	—	216	20	317	250	140	100	39	
22,539	2,001	6,354	97	—	227	36	55	14	218	134	28	
17,280	2,126	6,060	116	120	242	37	197	118	185	109	35	
4,008	1,467	2,524	71	—	149	— 18	110	158	72	110	63	
223,759	49,592	117,062	109	—	199	29	242	165	136	82	52	
69,938	—	33,893	—	—	213	—	—	—	—	—	—	
20,592	—	9,820	—	—	165	—	—	—	—	—	—	
29,495	—	15,339	—	—	194	—	—	—	—	—	—	
18,878	—	11,319	—	—	186	—	—	—	—	—	60	
2,895	—	1,810	—	—	187	—	—	—	—	—	63	
17,651	—	10,729	—	—	225	—	—	—	—	—	61	
15,870	3,549	5,140	123	—	182	— 2 1	113	118	45	47	32	
98,819	5,846	45,329	109	109	226	274	1,169	246	675	108	46	
70,727	16,321	43,071	71	—	173	8	40	30	164	144	61	
2,873	848	1,698	64	70	140	— 8 3	124	144	100	119	59	
10,049	2,073	5,638	88	—	201	19	226	175	172	128	56	
3,476	1,082	1,818	73	—	160	— 23	157	234	68	119	52	
750	537	472	110	—	189	— 49	19	181	— 12	72	63	
2,974	665	2,305	102	—	237	49	414	236	247	132	77	
51,225	18,454	22,222	98	—	126	— 6	370	400	20	29	48	
24,511	—	12,284‡	—	—	170	—	—	—	—	—	50	
13,083	2,324	6,213	83	—	185	20	118	82	167	123	47	
21,351	2,918	5,467	137	—	216	19	111	77	87	58	26	
31,222	1,237	5,943	133	—	290	120	441	145	380	118	19	
10,432	3,281	5,894	85	—	178	— 14	107	142	80	109	57	
1,043	382	681	72	—	158	— 19	100	156	78	119	65	
12,192	3,591	6,075	94	—	181	— 12	218	265	69	93	50	
—	150,503	356,842	100	—	188	20	119	83	126	88	44	
—	—	17,456	—	—	—	—	—	—	—	—	—	
—	—	339,386	—	—	—	—	—	—	—	—	—	

## TABLE

Serial No	Group	Description of Trades *	Persons Employed *		Power Available *			
					Total		Per Head Persons Employed	
			Number, '000. 1907	1924.	H P '000 1907.	1924	H P 1907	1924.
36	VII	<i>Textiles</i> —						
		Cotton Spinning and Weaving	572 0	517 2	1,239 2	1,575 6	2 17	3 05
		Spinning .. ..	—	—	—	—	—	—
		Weaving .. ..	—	—	—	—	—	—
37		Woollen and Worsted ..	259 6	275 9	319 2	517 3	1 23	1 87
38		Silk and Artificial Silk ..	31 7	39 2	18 8	53 7	0 59	1 37
39		Jute, Hemp, Linen ..	82 0	60 9	102 7	97 4	1 25	1 60
40		Hosiery .. ..	51 2	96 0	7 8	29 7	0 15	0 31
41		Rope Twine Net ..	14 3	13 8	15 3	27 8	1 07	2 01
42		Canvas Goods and Sacks ..	7 5	10 0	1 9	6 7	0 25	0 67
43		Elastic Webbing ..	4 2	5 5	1 5	2 8	0 36	0 51
44		Engine and Boiler Packing ..	2 3	6 6	2 3	13 5	1 00	2 04
		Asbestos ..						
45		Bleaching, Dyeing, Printing, Finishing .. ..	109 5†	107 8	190 2†	266 5	1 74	2 47
46		Lace .. ..	36 8	18 1	10 3	14 2	0 28	0 78
		Total Group VII ..	1,171 1	1,151 0	1,909 2	2,605 2	1 63	2 26
47	VIII	<i>Skins and Leather</i> —						
48		Fellmongery .. ..	1 7	2 4	0 7	3 1	0 41	1 29
49		Leather .. ..	28 7	30 5	22 5	74 3	0 78	2 44
		Saddlery, Harness .. ..	22 6	21 4	2 1	5 2	0 09	0 24
		Goods .. ..						
		Total Group VIII ..	53 0	54 3	25 3	82 6	0 48	1 52
50	IX	<i>Clothing</i> —						
51		Boot and Shoe .. ..	124 8	147 3	19 9	62 7	0 16	0 43
52		Glove Making .. ..	4 8	5 5	0 6	2 2	0 12	0 40
		Hat, Bonnet and Cap Making .. ..	32 9	30 5	5 3	12 4	0 16	0 41
		Total Group IX ..	162 5	183 3	25 8	77 3	0 16	0 42
53	X	<i>Food, Drink, Tobacco</i> —						
54		Grain Milling .. ..	31 5	34 5	155 3	198 2	4 93	5 74
55		Sugar and Glucose .. ..	6 5†	12 6†	13 6	38 9	2 09	3 09
56		Seed Crushing .. ..	7 7	14 0	26 5	73 5	3 44	5 25
57		Bacon Curing and Sausage .. ..	5 2	13 1	3 6	13 9	0 69	1 06
58		Cattle, Dog and Poultry Food .. ..	2 0	5 4	4 6	14 8	2 30	2 74
		Preserved Meat and Pickles, Sauce .. ..	—	35 0†	—	‡22 4	—	0 64
59		Butter, Cheese, Condensed Milk, Margarine .. ..	4 2	10 4	5 6	28 1	1 33	2 70
60		Spirit Distilling .. ..	4 1	4 6	10 5	15 7	2 56	3 42
61		Spirit Compounding and Methyllating .. ..	1 1	0 9	0 4	0 6	0 36	0 67
62		Brewing and Malting .. ..	78 4	67 1	57 3	101 2	0 73	1 51
63		Aerated Waters, Cider, and Vinegar .. ..	26 5	18 2	10 4	14 2	0 39	0 78
64		Wholesale Bottling .. ..	19 1	19 4	2 9	10 5	0 15	0 54
65		Tobacco .. ..	37 6†	38 8†	5 1	16 5	0 14	0 42
66		Fish Curing .. ..	24 7†	9 7†	0 2	1 4	0 08	0 14
67		Bread and Biscuit .. ..	100 8	151 2	17 5	80 3	0 17	0 53
		Total Group X ..	349 4	434 9	313 5	630 2	1 12	1 79
		‡ Deduct figures not comparable .. ..	68 8	96 1	—	22 4	—	—
			280 6	338 8	—	607 8	—	—
68	XI	<i>Woodworking, etc</i> —						
69		Coopering .. ..	4 9	4 6	2 4	4 9	0 49	1 07
70		Wooden Crates, Boxes, etc .. ..	12 3	12 2	9 5	25 4	0 77	2 08
		Basket and Wicker Work .. ..	3 6	3 4	0 1	0 5	0 03	0 15
		Total Group XI ..	20 8	20 2	12 0	30 8	0 58	1 52

\* The trades and undertakings dealt with in this Statement are only those included in the Census of No. 29, and the Numbers of persons employed, Horse Power available, Gross output and Net output have

† Figures for 1912.

§ Excluding Excise Duty.

## 1—contd.

Gross Output (Value) *	Net Output (Value) *					Percentage Increase or Decrease of Figures for 1924 on those for 1907					Net Output Value 1924 as Percentage of Gross Output Value 1924.	Serial No.		
	Total Value.		Value per Head Persons Employed			Persons Employed	Power available Total.	Power available per Head.	Net Output Value.	Net Output Value per Head				
	f'000 1924	f'000 1907	f'000 1924.	1907.	1912	1924.								
363,122	45,192	82,380	79	81	159	— 9 5	27	41	82	100	23	36		
193,867	—	—	—	—	190	—	—	—	—	—	—	—		
169,255	—	—	—	—	131	—	—	—	—	—	—	—		
196,284	18,429	51,733	71	82	187	6 3	62	52	181	163	26	37		
19,784	1,742	9,997	55	72	255	24	186	133	474	364	50	38		
24,128	5,087	8,540	62	71	140	— 26	— 5	28	68	126	35	39		
42,473	3,124	15,233	61	68	159	87	280	107	387	160	36	40		
7,224	1,155	2,332	81	81	169	— 3 5	82	88	102	109	32	41		
7,465	507	1,949	68	87	195	33	253	168	284	187	26	42		
1,926	283	853	68	72	155	31	87	42	201	128	44	43		
3,819	321	2,127	139	166	322	187	487	104	563	132	56	44		
41,255	11,935†	27,040	—	109	251	— 1 5	40	42	127	130	66	45		
9,297	3,606	2,952	98	93	163	— 50 8	38	179	— 18	66	32	46		
—	91,383	205,136	78	—	178	— 1 72	36	39	124	128	29			
4,842	146	788	86	—	328	41	343	215	440	282	16	47		
32,948	3,354	8,711	117	—	286	6	230	213	160	144	26	48		
6,689	1,603	3,147	71	—	147	— 5 4	148	167	96	107	47	49		
—	5,103	12,646	96	—	233	2 0	226	217	147	143	28			
55,384	8,860	25,035	71	—	170	18	215	169	183	140	45	50		
2,259	439	1,023	91	85	186	15	266	233	138	104	45	51		
13,509	2,172	5,224	66	—	171	— 7	134	156	141	159	39	52		
—	11,471	31,282	70	—	171	13	199	162	173	144	44			
101,479	5,607	11,763	178	—	341	9	28	16	110	91	12	53		
53,174 †	—	19,923 †	506 †	—	1,581 †	94	186	48	—	—	37	54		
36,344	1,385	3,832	180	—	274	82	177	53	177	51	11	55		
22,774	341	4,420	162	178	337	152	236	53	426	108	19	56		
6,693	313	2,088	156	149	387	170	222	19	567	148	31	57		
29,397†	—	11,625†	—	—	332	—	—	—	—	—	40	58		
25,541	675	4,497	161	—	432	148	401	103	566	168	18	59		
7,125	968	2,575	236	—	560	12	50	34	166	137	36	60		
6,597 †	400 \$	887 \$	363 \$	—	985 \$	— 18	50	86	122	171	13	61		
159,273 †	25,471 \$	45,942 \$	325 \$	—	685 \$	— 14	77	107	80	110	28	62		
10,391	3,317	5,751	125	131	316	— 31	37	100	73	153	55	63		
36,500	2,979	8,952	156	—	462	1 5	262	260	200	196	25	64		
93,241 †	—	23,942 †	155 †	—	617 †	3	223	200	—	298	26	65		
8,225	741	1,801	30 †	—	186	— 67 †	600	75	143	520	22	66		
108,125	10,483	38,483	104	—	255	50	365	212	267	145	36	67		
804,879	—	186,481	190	—	387	21	94	60	146	104	28			
341,682	—	55,490	—	—	—	—	—	—	—	—	—			
463,197	—	130,991	—	—	—	—	—	—	—	—	—			
2,775	449	1,052	91	—	229	— 6	104	118	134	152	38	68		
5,370	1,119	2,280	91	—	187	— 0 7	167	170	92	105	42	69		
814	1,241	495	67	—	146	— 5 6	400	400	105	118	61	70		
—	1,809	3,827	87	—	189	— 3 0	157	162	111	117	43			

Production Preliminary Reports, Nos 1 to 25, together with the Woollen and Worsted Industry (from Report reference only to such trades and undertakings

|| Including Excise Duty.

¶ Considerable amount of duplication in 1907 Census Figures.

## APPENDIX

## TABLE

Serial No	Group.	Description of Trades.*	Persons Employed *		Power Available *			
			Number, '000. 1907. 1924.		Total		Per Head Persons Employed	
			H P. '000 1907.	1924	H P 1907	1924	H P	1924
	XII	<i>Paper Making, Printing, Book Binding, etc —</i>						
71		Paper . . .	40 3	50 7	168 3	280 9	4 18	5 54
72		Wallpaper . . .	5 0	4 6	4 7	4 3	0 92	0 94
73		Cardboard Box . . .	20 4	19 5	2 2	7 2	0 11	0 37
74		Pens, Pencils, Artists' Materials . . .	6 4	6 9	1 4	4 1	0 22	0 60
75		Printing and Book Binding . . .	167 2	178 3	37 2	100 5	0 22	0 56
76		Printing and Publication of Newspaper . . .	43 7	56 8	15 2	64 0	0 35	1 13
77		Manufacturing Stationery ..	25 3	29 4	3 5	11 7	0 14	0 40
		Total Group XII ..	308 3	346 2	232 5	472 7	0 75	1 37
	XIII	<i>Building and Contracting —</i>						
	XIV	<i>Other Manufacturing Industries —</i>						
78		Rubber . . .	24 0	46 6	27 4	106 2	1 13	2 28
79		Musical Instruments . . .	10 0	20 0	2 2	14 0	0 22	0 70
80		Linoleum and Oil Cloth . . .	11 4	12 3	26 8	43 2	2 35	3 51
81		Billiard Table and Sports Requisites . . .	6 5	7 4	1 2	5 8	0 18	0 78
82		Games and Toys . . .	1 9	5 1	0 3	2 0	0 16	0 39
83		Packing . . .	—	8 0	—	3 4	—	0 42
84		Ice . . .	1 3	2 8	14 9	35 3	11 46	12 61
85		Umbrella and Stick . . .	7 6	5 5	1 0	2 3	0 13	0 42
86		Artificial Flower and Feather . . .	7 0	4 6	—	0 8	Nil	0 07
87		Brush Making . . .	11 1	11 0	2 1	6 3	0 19	0 57
88		Cocoonut Fibre, Horse Hair, Feather . . .	6 2	4 5	1 9	3 8	0 31	0 84
89		Scientific Instruments, Appliances, Apparatus . . .	14 2	25 1	2 9	15 7	0 20	0 63
90		Film Printing . . .	—	0 6	—	0 3	—	0 50
		Total Group XIV ..	101 2	153 5	80 7	238 6	0 79	1 62
		†Deduct Figures not comparable	—	8 6	—	3 7	—	—
			—	144 9	—	234 9	—	—
	XV							UNDER
91		Gas, Local Authorities .. . .	27 3	32 5	32 6	65 4	1 19	2 01
		,, Other .. . .	53 3	75 9	55 5	120 0	1 04	1 58
		,, Total Gas .. . .	80 6	108 4	88 1	185 4	1 09	1 71
92		Electricity, Local Authorities . . .	13 6	31 2	968 0	3,701 5	71 18	118 64
		,, Other . . .	8 3	15 5	563 8	1,680 3	67 93	108 41
		,, Total Electricity .. . .	21 9	46 7	1,531 8	5,381 8	69 95	115 24
93		Water, Local Authorities . . .	16 7	26 0	90 2	114 6	5 40	4 41
		,, Other . . .	4 7	5 7	46 7	62 8	9 94	11 02
		,, Total Water .. . .	21 4	31 7	136 9	177 4	6 40	5 60
94	XVI	Construction, Maintenance Repairs —						
		By Local Authorities on Undertakings other than Gas, Electricity, Water . . .	153 4	188 9	155 0	197 1	0 98	1 04
		By Others on Canals, Docks, Harbours, Tramways, Light Railways . . .	7 3	4 0	19 5	16 8	2 67	4 20
		Total, Local Authorities . . .	216 0	278 6	1,245 8	4,078 6	5 77	14 64
		,, Others . . .	77 4	107 2	685 5	1,883 1	8 86	17 57
		,, Groups XV and XVI . . .	293 4	385 8	1,931 3	5,961 7	6 58	15 45
95	XXI	Laundry, Cleaning and Dyeing ..	126 6	118 3	37 3	62 4	0 29	PER SONAL 0 53

\* The Trades and Undertakings dealt with in this Statement are only those included in the Census of No 29, and the numbers of Persons employed, Horse Power available, Gross output and Net output have

1—*contd.*

Gross Output (Value) *	Net Output (Value) *					Percentage Increase or Decrease of Figures for 1924 on those for 1907.					Serial No.	
	Total Value		Value per Head Persons Employed			Persons Employed	Power available Total	Power available per Head	Net Output Value	Net Output Value per Head		
	£'000. 1924	£'000 1907.	1924.	1907.	£ 1912							
36,495	4,479	12,814	111	126	253	25	67	33	186	128	35	
2,854	912	1,565	182	142	340	— 8	— 8	2	72	87	55	
5,482	1,062	2,972	52	61	153	— 4-6	227	236	180	200	54	
2,010	490	1,218	77	81	177	8	193	173	149	130	74	
55,238	14,715	37,941	88	96	213	7	170	155	158	142	65	
44,954	8,292	31,052	190	221	547	30	321	223	275	188	69	
10,211	1,897	5,378	75	—	183	16	234	186	184	144	52	
—	31,847	92,940	103	—	268	12	103	83	192	160	58	
23,309	2,981	11,503	124	—	247	94	288	102	286	99	49	
8,255	1,051	4,448	105	128	222	100	537	218	323	111	54	
11,336	1,231	5,248	108	230	426	8	61	49	326	295	46	
3,374	657	1,750	101	118	236	14	383	333	166	134	52	
1,458	110	706	58	66	138	169	566	144	542	138	48	
3,197 <sup>‡</sup>	—	1,704	—	213	—	—	—	—	—	—	53	
1,633	264	1,220	203	—	436	115	137	10	362	115	84	
2,774	613	1,056	81	—	192	— 28	130	223	72	137	85	
1,092	440	584	63	67	127	— 34	—	—	33	—	54	
3,526	858	1,738	77	—	158	— 1	200	200	103	105	49	
2,233	422	880	68	78	196	— 27	100	171	109	188	39	
9,451	1,534	5,304	108	—	211	77	441	215	246	95	56	
652 <sup>‡</sup>	—	170 <sup>‡</sup>	—	—	283	—	—	—	—	—	26	
—	10,161	36,311	100	—	238	43	191	105	239	138	50	
—	—	1,874	—	—	—	—	—	—	—	—	—	
—	—	34,437	—	—	—	—	—	—	—	—	—	
TAKING S	—	—	—	—	—	—	—	—	—	—	—	
20,694	5,560	9,870	203	—	304	19	101	69	78	50	48	
43,530	11,193	19,601	210	—	258	42	116	52	75	23	45	
—	16,753	29,471	208	—	272	35	110	57	76	31	46	
24,087	3,505	14,362	258	—	460	129	282	67	310	78	60	
13,242	1,971	7,713	237	—	498	87	198	60	291	110	58	
—	5,476	22,075	250	—	473	113	251	65	303	89	59	
16,344	7,165	13,136	429	—	505	56	27	— 18	83	18	80	
3,952	1,579	3,025	336	—	531	21	34	11	92	58	77	
—	8,744	16,161	409	—	510	48	30	— 12	85	25	80	
55,993	10,984	30,740	69	—	163	19	27	6	180	136	55	
867	577	603	79	—	151	— 45	— 14	57	5	91	70	
1,620	262	890	69	—	146	60	—	—	240	112	55	
117,118	27,214	68,108	126	—	244	29	227	154	150	94	58	
63,211	15,582	31,832	201	—	297	38	175	98	104	48	50	
—	42,796	99,940	146	—	259	31	209	135	134	77	55	
SERVIC E	20,717	6,963	16,080	55	—	136	— 6 5	67	83	131	145	78
											95	

TABLE

Group.	Description of Trades.*	Persons Employed *		Power Available *			
		Number ('000) 1907.   1924.		Total.   H.P. ('000) 1907.   1924.		Per Head Persons Employed	
						1907.   1924.	H.P.
III	Mining and Quarrying .. ..	865 0	1,208.8	2,358 6	4,128 7	2 73	3 42
IV	Bricks, Pottery, Glass .. ..	136 3	137.5	161 8	206 4	1.19	1.50
V	Chemicals, Dyes, Paints, etc ..	61.2	77.0	64.6	145 5	1.06	1.89
VI	Metals, Machines, Implements, Conveyances.	1,500 3	1,801 1	2,402 2	5,268 2	1.60	2.93
VII	Textiles .. .. .. ..	1,171 1	1,151 0	1,909 2	2,605.2	1 63	2 26
VIII	Skins and Leather .. .. ..	53 0	54.3	25 3	82.6	0.48	1.52
IX	Clothing .. .. .. ..	162.5	183 3	25 8	77.3	0 16	0 42
X	Food, Drink, Tobacco .. .. ..	280 6	338.8	313 5	607 8	1.12	1.79
XI	Woodworking, etc .. .. ..	20 8	20 2	12 0	30 8	0 58	1 52
XII	Paper Making, Printing, Book Binding, etc.	308 3	346 2	232 5	472 7	0 75	1.37
XIII	Building, Contracting .. ..	—	—	—	—	—	—
XIV	Other Manufacturing Industries ..	101 2	144 9	80 7	234 9	0.79	1 62
	Total IV-XIV .. ..	3,795 3	4,254 3	5,227.6	9,731 4	1.38	2 29
	Grand Total .. ..	4,660 3	5,463 1	7,586.2	13,860 1	1 63	2 54
XV	Gas, Electricity and Water Undertakings, and Construction, Maintenance and Repairs in Canals, Docks, Harbours, Tramways and Light Railways —						
XVI	Local Authorities .. ..	216 0	278 6	1,245 8	4,078 6	5 77	14 64
	Others .. .. .. ..	77.4	107 2	685 5	1,883 1	8 86	17 57
	Undertakings —						
	Total XV and XVI .. ..	293 4	385 8	1,991 3	5,961 7	6 58	15 45
XXI	Personal Service, etc — Laundry, Cleaning and Dyeing	126 6	118 3	37 3	62 4	0 29	0 53

\* The Trades and Undertakings dealt with in this Statement are only those included in the Census of No. 29, and the numbers of Persons employed, Horse Power available, Gross output and Net output have

## 2.—TOTALS.

Gross Output (Value).*	Net Output (Value) *				Percentage Increase or Decrease of Figures for 1924 on those for 1907.					Net Output Value 1924, as Percentage of Gross Output Value 1924	Group.		
	Total Value.		Value (f.) per Head Persons Employed		Persons Employed.	Power available.	Power available per Head.	Net Output Value	Net Output Value per Head.				
	£'000. 1924	£'000 1907.	1924.	1907									
TRIES.													
284,120	111,613	219,901	129	182	40	75	25	97	41	77	III		
38,042	9,950	25,075	73	182	1	27	26	152	150	66	IV		
70,758	10,254	29,733	168	386	26	125	78	190	130	42	V		
771,740	150,503	339,386	100	188	20	119	83	126	88	44	VI		
—	91,383	205,136	78	178	-1.7	36	39	124	128	—	VII		
44,479	5,103	12,646	96	233	2	226	217	147	143	28	VIII		
71,152	11,471	31,282	70	171	13	199	162	173	144	44	IX		
463,197	53,180	130,991	190	387	21	94	60	146	104	28	X		
8,959	1,809	3,827	87	189	-3	137	162	111	117	43	XI		
160,244	31,847	92,940	103	268	12	103	83	192	160	58	XII		
—	—	—	—	—	—	—	—	—	—	—	XIII		
68,441	10,161	34,447	100	238	43	191	105	239	138	50	XIV		
—	375,661	905,463	99	213	12	86	66	141	115	38			
—	487,274	1,125,364	105	206	17	83	56	131	96	43			
TAKINGS											XV		
117,118	27,214	68,108	126	244	29	227	154	150	94	58	XVI		
63,211	15,582	31,832	201	297	38	175	98	104	48	50			
—	42,796	99,940	146	259	31	209	135	134	77	55			
SERVICE													
20,717	6,963	16,080	55	136	-6.5	67	83	131	145	78	XXI		

Production Preliminary Reports, Nos. 1 to 25, together with the Woollen and Worsted Industry (from Report reference only to such Trades and Undertakings)



## CHAPTER II.

## COSTS OF PRODUCTION AND DISTRIBUTION.

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[For contents of Appendices I and II, *see* the lists prefixed thereto.]

## COSTS OF PRODUCTION AND DISTRIBUTION.

## INTRODUCTORY.

The cost of producing an article and sending it to the market in which it is to be sold is not the only, or necessarily a deciding, factor in determining the price at which it is sold. Broadly, identical goods can only be sold in the same market at the same time for a certain definite price. Supply and demand fluctuate, and in consequence, the prices realised for identical goods in the same markets may vary from day to day, from month to month, and from year to year. In the years before the war, therefore, industries were subject to fluctuations. There were periods when trade was profitable, followed by periods when trade could only be done either at no margin of profit or at a loss. Similarly, the trade boom that followed the termination of the war has in its turn been succeeded by periods of depression during which, the Committee have been informed, the British iron and steel industry, the shipbuilding industry and large sections of the engineering industry, as well as the textile industries, were for some time selling at or about, and frequently below their cost level. It has been stated in evidence that there are strong grounds for believing that, owing to the extremely keen competition of producers for a limited demand, all iron and steel producing industries in Europe have at various times in the post-war period sold at a loss. It would appear, indeed, to be a by no means unusual procedure for manufacturers, both in this country and in competing countries, to sell, particularly for export, below cost when circumstances demand it.

It must be remembered also that owing to the great diversity of situation, equipment and other factors, the cost of producing identical goods varies, even to a marked extent, between establishment and establishment. It follows, therefore, that while an industry as a whole may be experiencing a period of bad trade, during which its less fortunate members are compelled to sell at or below cost, those manufacturers who are favourably placed in all respects may be able to sell at a profit.

On balance, it is no doubt true that, broadly, selling prices are in the long run governed by the cost of production and distribution. Over a period a concern can only survive if its income is sufficient to pay its expenses. It cannot indefinitely continue to sell at a loss. If, therefore, its costs of production and distribution are such that it cannot hope to cover them at the average level of market prices, it must eventually go out of business.

The Committee have, moreover, received a mass of evidence that some staple products of British manufacture have at times been unable to compete in the markets of the world at foreign prices, and witnesses have stated that their experience shows that when their costs of production are reduced they are able to do increased business, and when for any reason the costs of production mount again the demand for their goods begins to fall away.

With a view to measuring the extent of the increased costs of production and distribution that have prevailed in post-war as compared with pre-war years, and estimating the importance of the several factors that have contributed to the increase, the Committee have throughout their inquiry invited evidence on the subject of costs and have in addition endeavoured to obtain, from trade associations and individual firms, representative figures relating to pre-war and post-war costs in the principal industries.\* The subject is one regarding which many manufacturers and traders feel a natural reluctance to give information ; and in any case changes in methods of keeping accounts, in the articles manufactured and in processes of manufacture make it difficult to compile comparable statistics in relation to periods so widely separated as that preceding the war and the post-war years. Valuable help has nevertheless been received in the matter from a number of firms and associations who have compiled and supplied data and given permission for their publication.

The figures obtained relate generally to one pre-war year, usually 1913, and one post-war year. Comparisons relating to one year only in each period may not afford so sure an indication of movements in costs as would be furnished by an average for two or three years in each period had this been available. In this connexion it should be remembered that 1913† was the year of best trade in the pre-war period, while in the post-war period conditions have been, on the whole, depressed. In view of the great fluctuations in costs that have occurred in the years since the war, it is fortunate that the post-war figures are, in the main, those of 1924, the year of the Census of Production, and 1925, during which years conditions in general do not appear to have been subject to violent fluctuations.

It should be remembered that while in some cases the figures are representative of the industries to which they relate, in others no representative character is claimed for them. They should, therefore

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\* A copy of the Schedule employed by the Committee will be found on page 150

| It will be seen from Table D, on page 640 of the "Survey of Overseas Markets," issued by the Committee, that the British exports of manufactured goods in 1912 were 96.5 per cent in value of those of 1913, and those of 1911 and 1910 91.6 and 88.6 per cent respectively.

be used only with great caution for the purpose of making deductions other than those to which attention is specifically called in this Chapter. It is important to remember, also, that 1925 is the latest year to which the statistics relate, and that since then there have been many changes of importance, which would have to be taken into account in any attempt to relate the information tabulated to the circumstances of later years.

In spite of all the qualifications to which they are subject, however, the figures contain much information not hitherto generally available\* and throw valuable light on the problems under investigation. They may be used to compare one industry with another as regards the "make-up" of total costs in either the pre-war or the post-war year; and from this point of view they show clearly what great differences there are in the proportions of materials, wages, and "other expenses" in the total costs of different industries. The figures may also be used (by comparing the pre-war with the post-war analyses in each industry) to throw light on the different ways in which the increased total costs in the various cases have been brought about, i.e. to what extent the increases have been due to materials or to wages or to "other expenses" respectively.

The design of this Chapter is to be explanatory of the statistics, and to call attention to some of the more important of the factors affecting costs of production and distribution, such as under-employment of undertakings, instability of prices of materials, changes in articles of manufacture, in hours of labour, in the methods and location of production, and in the organisation of business, etc. In view of the importance of transport charges in costs, a short section has been added embodying information in regard to the relative importance of wages and other items in the cost of railway, road and ocean transport. Certain other subjects of great importance from a cost point of view, such as standardisation of products, co-operative buying and selling, and other aspects of the efficiency of organisation, have been dealt with by the Committee in the volume "Factors in Industrial and Commercial Efficiency," and are not therefore brought within the scope of this Chapter, while other subjects are excluded as being more suitable for treatment in the Committee's report.

### COSTS OF PRODUCTION.

The inquiry has been directed especially to obtaining comparable statistics of the cost of various units of production in a pre-war

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\* The latest official publication in regard to the "make-up" of costs in several industries was the Report to the Board of Trade on the Relation of Wages in Certain Industries to the Cost of Production, 1891 (C 6355).

and a post-war year, in order to show the relative importance in each year of the principal items of cost, as parts of the total cost, and how much those items and the total cost had increased in the post-war as compared with the pre-war year.

The cost accounts of British industries exhibit wide variations in form and in the classification of expenses. For the purposes of the present Chapter, the elements of which the cost of production is composed have been grouped under three main heads, viz. :—

- (a) *Materials*.—Under this head is included the full cost, including, usually, transport charges, of all materials of manufacture. They may be either raw materials, such as iron ore or raw cotton, or manufactured or partly manufactured materials, such as steel billets, cotton yarn or leather, or yet again they may be bye-products or waste of other manufactures or processes. Materials are often themselves the finished products of other trades or processes, and their cost covers the cost of the raw materials, the wages and other expenses of the earlier processes, generally the cost of transport, and, assuming that they are sold at a profit, the return on the capital employed in the earlier stages of manufacture.
- (b) *Wages and Salaries*.—This head comprises the cost, not only of the labour directly employed in the particular trade or process of production and of the indirect labour employed in, e.g. the handling of materials, storekeeping, timekeeping and supervision, but of office staff and management. The heading covers therefore the total wages and salaries bill of the undertakings, except in so far as further remuneration is included in Other Expenses e.g. under the sub-head of Maintenance in cases where maintenance work is carried out by the undertakings' own staff, or under the sub-head of Other Charges. It has been assumed for the purposes of this Chapter that the returns made under the heading of Direct Wages cover all payments for labour that could be charged directly to a particular process or order.
- (c) *Other Expenses*.—This head covers the cost of power, light, water and heating; depreciation and maintenance of buildings and plant, including wages and the necessary materials where maintenance work is carried out by the manufacturers' own staff; rates, property tax, State insurance and workmen's compensation; and all other charges not included in the heads Materials or Wages and Salaries.

Interest on capital, taxes other than property tax, and outward freight on the products of manufacture, have been excluded from the statistics, except where it is otherwise stated in the detailed Tables on page 124 *et seq.*

There is considerable variation in the degree of detail in the figures furnished to the Committee. Some manufacturers have been in a position to render returns entering into the fullest detail, and in those cases it is possible to make an accurate analysis under the main heads of cost. Some of the information obtained, however, has been compiled by trade associations from returns received from their members, and, inasmuch as the methods of keeping cost accounts are by no means uniform, the figures supplied by the associations are necessarily in a summarised form. It is for that reason not always possible to make an accurate division between the main heads of cost in such cases, though such minor differences of classification as exist do not materially impair the utility of the statistics for the purposes of the present inquiry.

In the form in which the specimen cost figures are shown in Appendix I (page 124), provision has been made for giving particulars of cost under certain subsidiary headings, where the necessary information is available, so that it may be seen to what extent they have severally contributed to the increased cost of production. Thus in many cases separate figures are given of direct and indirect wages respectively, and of office and managerial salaries. The division between Wages and Salaries, however, may not in all cases be exactly between labour and office staff. In particular, it is probable that part of the salaries of office staffs, being paid weekly, are sometimes included in Wages. On the other hand, a tendency is observable for some persons who, before the war, were classified as wage-earners to be regarded in the post-war period as salaried officers. Salaries, too, are sometimes wholly or partly included in Other Expenses.

Similarly, the main division Other Expenses is sub-divided to show, where the information is available, the relative importance of (a) Power, Light, Water and Heating, etc.; (b) Maintenance and Depreciation of Buildings and Plant, and (c) Rates, Property Tax and Social Charges (viz. State Insurance and Workmen's Compensation).

The detailed returns relating to each industry set out in full in Appendix I, are summarised in the following Tables A and B. The footnotes to the summary tables draw attention to certain factors affecting the figures included in them, but it is important to remember that the figures are subject to whatever qualifications are mentioned in the detailed tables, and they should be interpreted only in the light of the fuller information set out therein.

## SUMMARY TABLE A.

*Comparison between Pre-war and Post-war Costs of Production, under three main heads.*

*Note.*—The figures tabulated below, which have been taken from the detailed Tables on page 124 *et seq.*, show in the first 3 columns the relative importance in the pre-war period of Materials, Wages and Salaries, and Other Expenses respectively in the total cost of production taken as 100, and in the last 4 columns the corresponding amounts of those costs in the post-war period. For example, the Table shows that if a quantity of coal cost £100 pre-war, £11.4 were for Materials, £75.3 for Wages and Salaries, and £18.3 for Other Expenses, and that in the post-war period those costs were respectively £19.6, £141.6 and £29.3, or together £190.5, the total cost having increased 90.5 per cent.

References have been inserted in the Table to the numbers of the detailed Tables from which the figures have been extracted.

Table	Industry.	Pre-war Period (Total cost = 100).			Post-war Period. (Pre-war total cost = 100).			
		Materials	Wages and Salaries	Other Expenses	Materials	Wages and Salaries	Other Expenses	Total
1	<i>Coal Mining*</i>	11.4	75.3	13.3	19.6	141.6	29.3	190.5
2	<i>Coke Making.</i>							
	Plant A	84.9	†10.3	4.8	142.6	†13.9	10.9	167.4
	Plant B	78.7	†11.7	9.6	168.7	†20.1	18.7	207.5
	Plant C	82.4	†10.7	6.9	180.9	†18.2	25.1	224.2
3	<i>Gas</i>	10.2	45.7	44.1	23.4	84.0	74.7	182.1
	<i>Iron and Steel</i>							
4	Basic Pig Iron*	82.5	8.9	8.6	127.3	17.4	13.4	158.1
5	Basic Steel—Ingots(a)*	73.5	14.8	11.7	115.4	26.6	19.4	161.4
	Semi-finished— products(a)*	70.8	16.3	12.9	114.7	30.4	22.8	167.9
	Sections(a)*	63.6	21.8	14.6	101.4	38.6	28.5	168.5
	Plates(a)*	62.9	23.0	14.1	104.3	39.6	27.6	171.5
6	Basic Pig Iron	84.3	8.6	7.1	135.6	14.6	17.5	167.7
	Steel Ingots	84.7	7.3	8.0	122.8	11.7	20.3	154.8
	Steel Billets	92.6	3.5	3.9	140.7	7.3	9.5	157.5
	Hematite Pig Iron	90.8	†5.9	3.3	111.1	†14.2	8.7	134.0
	Common Billets and Sheet Bars	87.0	4.8	8.2	157.8	10.6	14.9	183.3
7	Tinplates	70.3	†18.6	11.1	104.1	†37.7	26.0	167.8
8	Wire	75.5	16.9	7.6	104.0	32.3	16.8	153.1
	Wire Netting (b)	59.0	28.6	12.4	94.7	46.8	23.5	165.0
	<i>Engineering</i>							
10	Agricultural Machinery*	46.5	†36.3	17.2	77.7	†79.2	53.2	210.1
11	Locomotive Construction*	59.0	†32.0	9.0	73.6	†57.6	28.8	160.0
	Locomotive and Tender	—	—	—	60.0	46.4	23.6	130.0
12	Marine Engines and Boilers, etc	63.0	25.0	12.0	100.0	48.9	21.1	170.0
13	Condenser Plant	74.7	†14.2	11.1	111.3	†22.7	21.1	155.1
	Baling Press	79.5	13.9	6.6	131.2	32.1	19.2	182.5
	Heavy Oil Engine	61.6	26.5	11.9	70.6	33.1	16.3	120.0
	Spinning Frame	41.4	38.2	20.4	72.1	74.1	26.2	172.4
	Medium Sized Engine	40.5	40.4	19.1	74.5	72.7	47.5	194.7
	Pedal Bicycle	42.9	32.8	24.3	56.5	61.3	45.0	162.8

SUMMARY TABLE A.—*continued*

Table	Industry.	Pre-war Period (Total = 100)			Post-war Period (Pre-war total cost = 100).			
		Materials.	Wages and Salaries	Other Expenses	Materials.	Wages and Salaries	Other Expenses	Total.
14	<i>Electrical Engineering</i>							
14	Electrical Engineering *	48.3	†26.3	25.4	77.8	†52.1	53.1	183.0
	Motor .. ..	46.9	†25.2	27.9	68.5	†34.2	42.3	145.0
	Cables .. ..	78.1	†12.4	9.5	97.6	†33.6	19.2	150.4
15	<i>Shipbuilding (c)</i> .. ..	60.3	†33.5	6.2	88.9	†49.0	9.1	147.0
	<i>Chemicals, etc.</i>							
16	A Heavy Chemical ..	28.7	†19.9	51.4	50.2	†34.9	84.6	169.7
	Blasting Explosives ..	71.3	†7.1	21.6	81.2	†13.7	38.5	133.4
	Dyes (d) ..	33.0	(e)23.2	43.8	61.3	(e)64.1	95.3	220.7
	Household Soap ..	85.0	6.7	8.3	136.2	17.2	17.1	170.5
	<i>Textiles.</i>							
17	Cotton Spinning:—							
	American Cotton* ..	76.3	12.7	(f)11.0	153.9	27.0	(f)29.4	210.3
	Do * ..	75.8	13.2	(f)11.0	151.2	27.4	(f)29.4	208.0
	Egyptian Cotton* ..	64.1	22.5	13.4	203.8	44.5	25.9	274.2
	Do * ..	58.6	25.4	16.0	195.7	49.1	29.8	274.6
18	Cotton Weaving:—							
	Printers' Cloth ..	76.3	20.7	3.0	178.8	42.7	6.3	227.8
	Fine Woven Cloth ..	73.1	23.2	3.7	154.5	45.1	9.4	209.0
	Cloth C ..	74.1	†19.1	(f)6.8	189.6	†35.8	(f)15.1	240.5
19	Hosiery:—							
	Men's Underwear ..	67.8	25.6	6.6	92.3	46.3	14.5	153.1
	Knitted Goods ..	65.8	26.3	7.9	—	—	—	—
	<i>Clothing</i>							
20	Ready Made Clothing (g)	41.3	54.0	4.7	75.3	124.1	19.1	218.5
	Do (g) ..	37.5	†50.0	12.5	63.7	†98.5	25.5	187.7
	Do ..	55.2	36.1	8.7	—	—	—	—
21	Boots and Shoes* ..	63.6	†23.9	12.5	116.8	†54.4	33.1	204.3
	Do * ..	70.5	†21.3	8.2	114.1	†55.4	14.2	183.7
	Do ..	68.2	23.3	8.5	110.3	46.1	11.7	168.1
	Do ..	65.9	28.5	5.6	109.0	56.8	11.6	177.4

\* These figures refer to groups of firms, and have been supplied to the Committee as representative of the industries to which they relate. All other figures were supplied by individual undertakings.

† Salaries are wholly or partly included in Other Expenses.

(a) These figures represent the cumulative cost beginning with the pig iron manufacture, and Materials comprise the cost of coal, coke, ore, ironstone and fluxes only. See note to Table 5, page 131.

(b) Manufacture of wire netting from billets.

(c) The figures refer to a specified type of ship and relate to the cost of the hull only.

(d) Manufacture from basic raw materials.

(e) Including State insurance and workmen's compensation.

(f) Including interest.

(g) Making and trimming only. The cost of the cloth is excluded.

## SUMMARY TABLE B

*Percentage Distribution of Costs of Production, under three main heads, in the Pre-war and Post-war Periods.*

*Note*—The figures tabulated below have been extracted from, or based upon, the detailed Tables on page 124, *et seq.*, and are designed to show what changes, if any, there were in the post-war period as compared with the pre-war period in the relative importance of Materials, Wages and Salaries, and Other Expenses respectively, in the total cost of production taken as 100 in each period. It should be borne in mind that the Table gives no indication of the extent of the increase in cost in the post-war period as compared with pre-war, and the pre-war and post-war figures are not comparable in the same way as those of Summary Table A. For example, in Coal Mining, Materials will be seen to have accounted for 11.4 per cent. of total cost pre-war and 10.3 per cent post-war, but while the relative importance of Materials had thus declined it will be seen from Summary Table A that their amount per unit of production had increased, and that the total cost of production having increased by 90.5 per cent. Materials accounted for 19.6 units of value post-war as compared with 11.4 pre-war.

References have been inserted in the Table to the numbers of the detailed Tables on which the figures are based.

Table	Industry	Pre-war Period (Total = 100)			Post-war Period (Total = 100)		
		Materials	Wages and Salaries	Other Expenses	Materials.	Wages and Salaries	Other Expenses.
1	<i>Coal Mining*</i>	11.4	75.3	13.3	10.3	74.3	15.4
2	<i>Coke Making</i>						
	Plant A .. ..	84.9	†10.3	4.8	85.2	†8.3	6.5
	Plant B .. ..	78.7	†11.7	9.6	81.2	†9.7	9.1
	Plant C .. ..	82.4	†10.7	6.9	80.7	†8.1	11.2
3	<i>Gas</i>	10.2	45.7	44.1	12.9	46.1	41.0
	<i>Iron and Steel</i>						
4	Basic Pig Iron* .. ..	82.5	8.9	8.6	80.5	11.0	8.5
5	Basic Steel—Ingots (a)*	73.5	14.8	11.7	71.5	16.5	12.0
	Semi-finished products (a)* .. ..	70.8	16.3	12.9	68.3	18.1	13.6
	Sections (a)* .. ..	63.6	21.8	14.6	60.2	22.9	16.9
	Plates (a)* .. ..	62.9	23.0	14.1	60.8	23.1	16.1
6	Basic Pig Iron .. ..	84.3	8.6	7.1	80.9	8.7	10.4
	Steel Ingots .. ..	84.7	7.3	8.0	79.3	7.6	13.1
	Steel Billets .. ..	92.6	3.5	3.9	89.3	4.7	6.0
	Hematite Pig Iron .. ..	90.8	†5.9	3.3	82.9	†10.6	6.5
	Common Billets and Sheet Bars	87.0	4.8	8.2	86.1	5.8	8.1
7	Tinplates .. ..	70.3	†18.6	11.1	62.1	†22.5	15.4
8	Wire .. ..	75.5	16.9	7.6	67.9	21.1	11.0
	Wire Netting (b) .. ..	59.0	28.6	12.4	57.4	28.4	14.2
	<i>Engineering</i>						
9	Engineering Industry <sup>1</sup> (1926)	—	—	—	46.1	35.7	18.2
10	Agricultural Machinery <sup>1</sup>	46.5	†36.3	17.2	37.0	†37.7	25.3
11	Locomotive Construction*	59.0	†32.0	9.0	46.0	†36.0	18.0
	Locomotive and Tender	—	—	—	46.2	35.7	18.1
12	Marine Engines and Boilers, etc.	63.0	25.0	12.0	59.0	28.8	12.2

SUMMARY TABLE B—*continued.*

Table.	Industry.	Pre-war Period (Total = 100)			Post-war Period (Total = 100).		
		Materials	Wages and Salaries.	Other Expenses	Materials	Wages and Salaries.	Other Expenses
13	<i>Engineering</i> — <i>continued.</i>	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
	Condenser Plant ..	74.7	†14.2	11.1	71.8	†14.6	13.6
	Baling Press ..	79.5	13.9	6.6	71.9	17.6	10.5
	Heavy Oil Engine ..	61.6	26.5	11.9	58.8	27.6	13.6
	Spinning Frame ..	41.4	38.2	20.4	41.8	43.0	15.2
	Medium Sized Engine ..	40.5	40.4	19.1	38.3	37.3	24.4
	Pedal Bicycle ..	42.9	32.8	24.3	34.7	37.6	27.7
14	<i>Electrical Engineering</i>						
	Electrical Engineering* ..	48.3	†26.3	25.4	42.5	†28.5	29.0
	Motor ..	46.9	†25.2	27.9	47.2	†23.6	29.2
	Cables ..	78.1	†12.4	9.5	64.9	†22.3	12.8
15	<i>Shipbuilding (c)</i> ..	60.3	†33.5	6.2	60.5	†33.3	6.2
	<i>Chemicals, etc</i>						
16	A Heavy Chemical ..	28.7	†19.9	51.4	29.6	†20.6	49.8
	Blasting Explosives ..	71.3	†7.1	21.6	60.9	†10.3	28.8
	Dyes (d) ..	33.0	(e)23.2	43.8	27.8	(e)29.0	43.2
	Household Soap ..	85.0	6.7	8.3	79.9	10.1	10.0
	<i>Textiles</i>						
17	Cotton Spinning —						
	American Cotton* ..	76.3	12.7	(f)11.0	73.2	12.8	(f)14.0
	Do * ..	75.8	13.2	(f)11.0	72.7	13.1	(f)14.2
	Egyptian Cotton* ..	64.1	22.5	13.4	74.4	16.2	9.4
	Do * ..	58.6	25.4	16.0	71.3	17.9	10.8
18	Cotton Weaving —						
	Printers' Cloth ..	76.3	20.7	3.0	78.5	18.7	2.8
	Fine Woven Cloth ..	73.1	23.2	3.7	73.9	21.5	4.6
	Cloth C ..	74.1	†19.1	(f)6.8	78.9	†14.9	(f)6.2
19	<i>Hosiery</i>						
	Men's Underwear ..	67.8	25.6	6.6	60.3	30.2	9.5
	Knitted Goods ..	65.8	26.3	7.9	64.5	28.5	7.0
	<i>Clothing</i>						
20	Ready Made Clothing (g) ..	41.3	54.0	4.7	34.5	56.8	8.7
	Do (g) ..	37.5	†50.0	12.5	34.0	†52.5	13.5
	Do ..	55.2	36.1	8.7	53.5	36.5	10.0
	Do ..	—	—	—	65.6	25.4	9.0
21	Boots and Shoes* ..	63.6	†23.9	12.5	57.2	†26.6	16.2
	Do * ..	70.5	†21.3	8.2	62.1	†30.2	7.7
	Do ..	68.2	23.3	8.5	65.6	27.4	7.0
	Do ..	65.9	28.5	5.6	61.4	32.0	6.6

\* These figures refer to groups of firms, and have been supplied to the Committee as representative of the industries to which they relate. All other figures were supplied by individual undertakings.

† Salaries are wholly or partly included in Other Expenses.

(a) These figures represent the cumulative cost beginning with the pig iron manufacture, and Materials comprise the cost of coal, coke, ore, ironstone and fluxes only. See note to Table 5, page 131.

(b) Manufacture of wire netting from billets.

(c) The figures refer to a specified type of ship and relate to the cost of the hull only.

(d) Manufacture from basic raw materials.

(e) Including State insurance and workmen's compensation.

(f) Including interest.

(g) Making and trimming only. The cost of the cloth is excluded.

In entering upon the consideration of the relative importance of the several heads of cost, it is necessary to emphasise the changes of every kind that have overtaken industry in the interval between the periods to which the available information relates. The conditions of industry are essentially dynamic. It is impossible, therefore, to regard industry in any period as being in a state of normality. The relative importance of industries is for ever shifting; new industries are born, while others decay and eventually die out. Within each industry, with possibly a few exceptions, the articles of manufacture are subject to change of design, and there are also great changes in the methods of manufacture and the layout of factories. In the period since 1913 all these tendencies towards change have been possibly more than usually active. For that reason it is probably unsafe to regard the movements in the cost of producing identical articles, as indicated by the specimen costings supplied to the Committee, as accurately representing the movements in the costs of industry as a whole. It must be remembered too, in considering the specimen figures, that it is not disputed that for reasons of relative efficiency and other circumstances, costs vary widely even between undertakings producing similar commodities.\* The figures covering returns from large numbers of manufacturers, also, while they furnish a reliable indication of the average trend of movements in costs, are not necessarily representative of all parts of the industries to which they relate, inasmuch as the principal industries are for the most part subdivided into groups whose products may be widely different from each other.

### Relative importance of main heads of cost.

*Relative importance of Materials and Wages and Salaries† respectively in different Industries, post-war.*

It will be seen from Summary Tables A and B that the relative importance of Materials and Wages (including Salaries) varies within wide limits. In coal mining, where Materials comprise only timber and stores, Wages and Salaries (in May-July, 1925) accounted for, on an average, some 74½ per cent. of the cost per ton of coal disposable commercially. In the iron and steel industry, Materials in pig iron manufacture amounted on the basis of the figures

\* Cf. Appendix III to this Chapter, page 159, which contains notes on costs of production in the metallurgical coke, iron, steel and engineering industries.

† The references made to Wages and Salaries are in every case to the remuneration of persons directly or indirectly employed in the particular trade or process of production, and not to the proportion of total cost represented ultimately by wages and salaries if the remuneration of workers in all stages of production and in ancillary work is taken into account. Cf page 74

supplied to 80 to 83\* per cent. of the whole cost and Wages and Salaries to about 10 per cent., while in steel ingot manufacture Materials were 79 per cent. and in steel billets from 86 to 89 per cent. Wages and Salaries in steel ingot manufacture were  $7\frac{1}{2}$  per cent., and in steel billets from  $4\frac{1}{2}$  to 6 per cent. The combined effect of the several proportions in the separate stages of iron and steel manufacture is shown by the cumulative cost figures, the average of firms representative of the principal districts, furnished by the National Federation of Iron and Steel Manufacturers. The raw materials, i.e. coal, coke, iron ore, ironstone and fluxes, will be seen to have accounted in 1924 for some  $71\frac{1}{2}$  per cent. of the cost of steel ingots, about  $68\frac{1}{2}$  per cent. of that of semi-finished steel, and roughly 60 per cent. in sectional material and plates, while Wages and Salaries increased from  $16\frac{1}{2}$  per cent. at the steel ingots stage to 18 per cent. in the semi-finished stage and 23 per cent. in sectional materials and plates. These cumulative figures, however, are those of undertakings which, with one exception, carry out all the stages of manufacture beginning with the raw materials, and the fact that they contain no element of departmental or other profit or of depreciation doubtless affects the stated proportions of Materials and Wages. It is probable also that those proportions are somewhat affected by reason of the fact that in the figures the scrap used, which is cheaper than pig iron, is reckoned as pig iron, i.e. the Tables are drawn up on the assumption that the steel was made from 100 per cent. pig iron.

In the engineering industry, which is a large user of steel products, Materials on an average accounted for roughly 46 per cent. of total cost and Salaries and Wages between 35 and 36 per cent. The industry is, however, one of great diversity, and it will be seen that Materials, in cases where the work is principally that of, e.g. assembling heavy purchased castings, may account for more than 70 per cent. of total cost, and Wages and Salaries may amount to only 15 per cent. In other cases, where there is much additional work, Wages and Salaries account for as much as 43 per cent. of the cost and Materials only some 40 per cent. The differing relative importance of Materials and Wages within industries is also exemplified in the

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\* The Census of Production of 1924 shows materials purchased and used to have amounted to 85.8 per cent. of the total output at selling values of the blast furnaces. Other percentages shown by the Census results are coke 79.5, shipbuilding 56.6, engineering generally 45.5, electrical engineering 51.9, textile machinery 38.2, cotton spinning 75.9, and hosiery 59.2. In the Census returns materials comprise not only the materials of manufacture, but all fuel, oil, gas and electricity purchased, packing materials, and materials for repairs to the firms' own buildings or plant executed by their own workpeople.

case of the electrical and chemical industries. In electrical engineering generally Materials comprised 42½ per cent. of the cost, and Wages some 28½ per cent. In the construction of electrical motors Materials appear to have accounted for some 47 per cent. of total cost and Wages 23½ per cent., while in cable making Materials accounted for 65 per cent. of the cost and Wages about 22 per cent. In a heavy chemical and in dye making, Materials amounted to roughly 30 per cent. of the total cost, while Wages alone in the former case formed 20 per cent., excluding the wages of maintenance staff, and Wages and Salaries in the latter some 29 per cent. In the manufacture of explosives Materials were as heavy as 61 per cent., and Wages by themselves only 10 per cent.

In the textile industries the relative importance of Wages and Materials is largely dependent on the greatly fluctuating prices of raw materials. In 1925 Materials appear to have formed rather more than 70 per cent. of the cost of spinning American cotton and Wages and Salaries roughly 13 per cent. In the spinning of finer counts from Egyptian cotton Materials accounted for from 70 to 75 per cent., and Wages and Salaries between 16 and 18 per cent., Materials being less and Wages and Salaries more as the fineness of the counts increased. In the weaving of cotton cloth, Materials appear to have accounted in 1924 and 1925 for between 70 and 80 per cent. of the total cost, and Wages and Salaries for from 15 to 22 per cent.

In industries where Materials represent such a large proportion of the total cost, it is clear that fluctuations in the price of the materials will exert an important influence on the "make-up" of the total cost of production. For example, if Materials represent 70 per cent. of the cost at a given date and subsequently undergo a reduction in price of one-fifth, then (assuming the remaining items of cost do not vary) the percentage of the total cost represented by Materials will fall to 65, while the percentage represented by Wages and Other Expenses together will (although their actual amounts remain unchanged) stand at 35 per cent. instead of (as previously) at 30 per cent. As pointed out later, the price of cotton has fluctuated between wide limits during post-war years, and consequently the proportions of the cost of spinning or weaving represented by Materials, Wages and Other Expenses respectively have therefore varied considerably throughout the period. Information published in December, 1927, by the Cotton Yarn Association yields the following analyses of spinning and weaving costs with cotton futures at 11d. a lb. :—

		<i>A Standard</i>	<i>A Standard</i>	<i>A Standard</i>
		<i>Prinier.</i>	<i>Shirting.</i>	<i>Dhootie.</i>
		<i>Proportions of total spinning cost.</i>		
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Materials	..	..	70·7	73·6
Wages	..	..	15·3	14·3
All Other Expenses, in- cluding Interest	..	..	14·0	12·1
		<hr/>	<hr/>	<hr/>
		100·0	100·0	100·0
		<hr/>	<hr/>	<hr/>
		<i>Proportions of total weaving cost.</i>		
Materials	..	..	71·7	75·4
Wages	..	..	21·0	18·3
All Other Expenses, in- cluding Interest	..	..	7·3	6·3
		<hr/>	<hr/>	<hr/>
		100·0	100·0	100·0
		<hr/>	<hr/>	<hr/>

In the case of the wool textile industry the Committee have not been able to obtain cost figures for 1924 or 1925. It is certain that Materials represent the largest single item in the cost of cloth. In the case of certain Yorkshire tweeds and uniform cloths, the percentage of total cost represented by Materials immediately before the war averaged 58 per cent. for the tweeds and 70 per cent. for the uniform cloths (Profiteering Acts Committees' Reports, Cmd. 858 and 1339). The pre-war percentage of Wages in the same tweeds averaged about 20 per cent., and in the uniform cloths rather less. The indications are that the relative importance of these items has not been substantially different in recent years.

In an article on the wool textile industry published in the "Times" (13th December, 1927) it was stated that over the whole industry the average distribution of costs on a full time basis was roughly as follows:—Raw materials and fixed charges, 60 per cent. ; wages, 25 to 30 per cent. ; other variable charges, 10 to 15 per cent. These figures are naturally not comparable with the pre-war percentages given above for specific kinds of cloth.

*Variations as between the Pre-war and Post-war Years in the relative importance of Materials and Wages and Salaries respectively.*

The cost of Materials and that of Wages and Salaries in production have in most cases varied at different rates in the post-war period as compared with the corresponding costs before the war, and there are in consequence certain changes in the relative importance of those heads of cost. The changes do not, however, appear to be all, or generally, in one direction. In iron and steel manufacture,

Wages and Salaries will be seen to have increased in relative importance on an average by between 1 and  $1\frac{1}{2}$  per cent. of total cost,\* while the relative importance of Materials generally appears to have declined by some 2 or 3 per cent. A rather more pronounced fall in the relative importance of Materials is observable in some branches of engineering. In electrical engineering the average decline was 6 per cent., and Wages increased in importance by some 2 per cent. In agricultural machinery Wages accounted for  $1\frac{1}{2}$  per cent. more than before the war, and Materials declined by as much as  $9\frac{1}{2}$  per cent. In locomotive construction there was an even greater fall in the relative importance of Materials, viz., 13 per cent., and an increase in Wages by 4 per cent. In Egyptian cotton spinning, Wages and Salaries in 1925 were 6 to 8 per cent. of total cost less than pre-war, while Materials had increased to a greater extent. In cotton weaving, too, Wages and Salaries accounted for 2 to 4 per cent. less of total cost, and Materials from 1 to 5 per cent. more.

In the case of both of these main heads of cost there are some factors which have tended to increase their relative importance and others which have tended to diminish it. In the textile industries for example the high price of imported raw materials resulted in a great increase in the importance of Materials. In other industries, while increases have occurred in the prices of materials, developments of various kinds have facilitated the use of less or of different materials, and there has been a fall in the relative importance of Materials costs. In regard to Wages and Salaries the increases in remuneration, the shortening of working hours, and certain other factors discussed on page 91 *et seq.* of this Chapter, have tended to make that head of cost bulk more largely. In times of depression, too, such as that to which much of the Committee's post-war information relates, the remuneration of pivotal men and office staff has to be spread over a smaller output, and for that reason is greater per unit of production. Apart, moreover, from the changes shown by the Tables, which, with few exceptions, relate to the pre-war and post-war production of precisely similar commodities in each case, there is an increasing tendency for the industries of this country to specialise in the finer products in which their greater skill and experience enable them to compete more successfully with foreign manufactures, and in these finer and more specialised products Wages and Salaries are often relatively more important than in industry as a whole. Such factors as these have operated to increase the relative importance of Wages and Salaries, but their effect appears to have been in large measure counteracted by great improvements in methods of production, by better layout of factories and workshops and by the increasing use of labour-aiding devices.

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\* The variations quoted in this paragraph are all calculated as percentages of total cost

*Variations in the relative importance of Other Expenses.*

Other Expenses are subject to great variation from one industry to another. In coke making they accounted, in the post-war year (See Table B), for 6½ to 11 per cent. of total cost, in cotton weaving for 3 to 6 per cent., in the iron and steel industry for 6 to 17 per cent., in engineering for 10 to 30 per cent., in bleaching\* for 35 to 45 per cent., and in the chemical industry for as much in some instances as 50 per cent. Generally, the heaviest item in this head of cost is Maintenance and Depreciation of buildings and plant, which formed upwards of 6 per cent. of the total cost in cotton spinning, from 3 to 10 per cent. in engineering, 8 per cent. in explosives, 12½ per cent. in dyes, and 22 per cent. in a heavy chemical. Repairs and maintenance alone amounted to from 6 to as much as 15 per cent. in the cumulative cost figures of iron and steel manufacture. Power, Light, Water and Heating accounted for a fraction of 1 per cent. in hosiery, roughly 1 per cent. in cotton weaving and in boots and shoes, 2 to 2½ per cent. in cotton spinning, an average of 3 per cent in engineering, up to 7 per cent. in steel manufacture, and for as much as 17 per cent. in a heavy chemical. On an average this item accounted for between 2 and 3 per cent. of total cost, as also did Rates, Property Tax and Social Charges †. It will be seen that Other Expenses generally bulk more largely in the post-war period than before the war. This is due partly to the additional charges for maintenance and depreciation, fuel, power, rates, etc., that have followed the extensions of capacity, improvements of plant, and the increased provision of mechanical aids to labour; also to the fact that trade generally has been comparatively slack and Other Expenses, which consist largely of fixed charges, have in consequence been spread over a smaller output. In agricultural machinery for example, they represented 17 per cent. of total cost in 1913 and as much as 25 per cent. in 1923; in locomotive construction the increase was from 9 per cent. of total cost in 1913 to 18 per cent. in 1925.

**Materials.**

*The severe fluctuations in market prices of materials since the war.*

The market prices of materials are for the most part subject to constant fluctuations, and in the years following the war these have

\* The Bleaching Trade Advisory Board supplied the following figures as representing generally the analysis of costs in the trade as a whole in August, 1925 —

	Percentage of Total Cost.					
Materials .. .. .. .. ..	20-30					
Wages .. .. .. .. ..	35-45					
Other Expenses and Overhead Charges ..	45-25					
						100

† Cf. "Factors in Industrial and Commercial Efficiency," pages 473 *et seq.*, where this subject is dealt with more fully.

been violent. The average ascertained selling price of No. 3 Cleveland pig iron, for example, which in the June quarter of 1914 was £2 11s. a ton, fell from £4 15s. 9d. a ton in the first quarter of 1924 to £4 a ton in the last quarter, while in 1925 it fell further from £3 18s. 7d. in the March quarter to £3 5s. 9d. in the December quarter. Similarly, the ascertained selling prices of Northamptonshire pig iron fell from £4 7s. 6d. a ton to £3 15s. 2d. in 1924, and from £3 12s. 9d. to £2 19s. 4d. in 1925. The weekly closing prices for soft steel billets on the London Metal Exchange in 1924 ranged from £8 10s. a ton early in January, and at the end of April and the beginning of May, to £7 10s. a ton in August and December. In 1925, the greatest variation was from £8 5s. to £6. The weekly closing prices of best selected copper on the same Exchange varied in 1924 from £72 5s. a ton in March to £64 5s. a ton in July, while in 1925 the variation was from £72 in January to £62 in June. The price of tin is subject to great fluctuation. In March, 1922, the monthly average of weekly closing prices on the London Metal Exchange was as low as £143 5s. a ton. By March, 1924, it had reached £277 11s. There was then a sharp fall to £219 6s. in May and June, followed by a recovery to £254 15s. in August and £262 in December. By April, 1925, it had fallen to £237 2s., but from then onward it rose month by month to £285 1s. in December. Great fluctuations are also observable in the monthly average of weekly closing prices of lead, which varied between £28 12s. 6d. and £43 12s. 6d. a ton in 1924 and £31 7s. 6d. and £43 2s. 6d. in 1925, and those of spelter, which fluctuated from £30 6s. 3d. to £38 12s. 6d. a ton in 1924, and from £33 10s. to £40 12s. 6d. in 1925.

The prices of raw cotton also have been subject to very violent fluctuations. The "spot" quotation for American middling cotton on the Liverpool Cotton Exchange, which on 1st August, 1914, was 6½d. a lb., reached 2s. 6d. a lb. in February, 1920; a year later it had fallen almost to its pre-war level, but it rallied to nearly 1s. 3d. a lb. in September, 1921, and declined again to 10d. before the close of the year, in 1922 it rose from a little more than 9d. to 1s. 3d. a lb.; a year later it was 1s. 9d. a lb., while in the early months of 1924 it was round about 1s. 6d. a lb., but had fallen to 1s. 1d. by the close of the year; at the end of 1925 it stood at 10d. a lb.

The examples given are probably sufficient to indicate broadly the importance of the fluctuations in the average market prices of some of the principal materials of manufacture. They do not, of course, indicate the day to day variations in prices which are very important to the manufacturer who is, in the face of competition, under the necessity of working to a narrow margin of profit. They are, however, sufficient evidence that the cost of production may be subject to great variation by reason of the fluctuations in Materials costs.

*Effect of fluctuating prices of materials on the cost of production.*

The serious element of uncertainty which the fluctuations in Materials costs import into the relationship between the cost of production and selling prices has itself a detrimental effect on costs and on production. In some industries, e.g. cotton spinning, the producer can to a large extent protect himself by market operations from loss due to these fluctuations; but in industry generally, the manufacturer who in a falling or violently fluctuating materials market runs the risk of having to sell his finished products at a price which, owing to the collapse of the market in the meantime, is less than the cost of production, cannot be expected in such circumstances to endanger his solvency by embarking on manufacture on the largest scale of which his works are capable. He will carry small stocks of material, his production will tend to be restricted, and his costs for that reason higher than they should be inasmuch as his fixed charges will have to be spread over a smaller output.

The holding back from buying, which is natural in a falling market, itself creates a lessening demand for materials. This in its turn tends, until such time as the supply of materials has adjusted itself to the reduced demand, to reduce market prices still further, and in so doing increases the hesitancy of manufacturers in buying materials and embarking on production. While it may to some extent be offset by other factors, the normal effect of a rapidly falling or uncertain market is therefore to make the cost of production higher than it should be, that is, high in relation to the lower level of selling prices, even though, measured in money values, it may be reduced.

On the other hand, an appreciable increase in the cost of materials in a time of bad trade results in an increased cost of production which industry is not in a position to bear, while such a rise in Materials costs even in a time of improving trade may largely neutralise the benefit of the improvement. Thus, during the first six months of 1923 there was an improved demand for British pig iron, but the excessive price of furnace coke, due to heavy demands from France, Belgium and Germany, in the absence of supplies from the Ruhr, increased the cost of production of pig iron during that period to a point at which its manufacture was practically unremunerative,\* although prices showed a considerable increase on those ruling in 1922.

There is every reason to believe, therefore, that the uncertainty and violent fluctuations, both upward and downward, of materials markets, which have been so pronounced a feature of the years since the war, have been harmful in their effects on industry, and that more stable market conditions could not fail, through the relative stabilisation of the cost of production, to have beneficial results.

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\* Report of Secretary for Mines for 1923, page 23.

*Effect of "vertical" organisation on Materials costs.*

The cost of materials per unit of production varies to an appreciable extent as between different manufacturers of similar articles inasmuch as that cost reflects not only the varying cost of many differing grades and qualities of raw materials, but also success or otherwise in buying materials at the appropriate moment or on advantageous terms. There is little doubt, for example, that the large buyer is often able to secure his supplies more readily and probably on more advantageous terms than the small buyer.

The uncertainty of supplies and prices of materials has doubtless been an important factor tending to encourage manufacturers either to produce their raw and other materials themselves or to combine in some manner (*Cf. "Factors in Industrial and Commercial Efficiency,"* page 68 *et seq.*) with others who produce them. Thus, the Committee have been informed that, broadly, British pig iron manufacturers control their iron ore supply to the extent of about 72 per cent. of the total, their coal supply to the extent of about 62 per cent. of the total, and their limestone supply to the extent of approximately 60 per cent. To a great extent also steelmakers are also manufacturers of pig iron. Such control of the materials of manufacture may be presumed to confer substantial advantages in relation to Materials costs, inasmuch as it provides for an assured supply of materials at a relatively stable cost. It is probable, moreover, that the withdrawal of so large a proportion of materials from the markets increases, by reducing the market supply, the sensitivity of the markets to the fluctuations of demand. The greater variations in market prices that may in consequence be expected to result will affect those producers who are not vertically organised, thus increasing the relative advantage in stable Materials costs conferred by such organisation.

*Effect of location of manufacture on Materials costs.*

The location of manufacture is an important factor in relation to the cost of materials. That of blast furnaces, for example, has depended upon a variety of considerations, the most important of which has been the reduction to a minimum of transport charges on materials and products, which are both bulky and heavy; proximity to coal and ore, and access to markets have therefore been dominating considerations. The juxta-position of Cleveland ironstone and Durham coking coal led, for example, to the occurrence of the large concentration of pig iron production on the North-East Coast, where approximately 30 per cent. of all the pig iron produced in the country is manufactured. Similarly, the heavier branches of the engineering industry are advantageously placed in relation to Materials costs in that they are for the most part grouped round the steel-producing districts. The agricultural engineering industry, on the other hand, is mainly situated near its principal home markets.

and does not appear to enjoy a similar advantage; nor is it advantageously placed for export (Cf. Appendix III to this Chapter, page 166). The transport charges on its materials are stated to amount to 5·4 per cent of the selling value of some of its products.

In recent years the heavy cost of mining Cleveland ore at considerable depths below the surface and the opening up of new basic ore fields in other parts of the country, especially in Northamptonshire, Oxfordshire and Lincolnshire, have resulted in the introduction of a larger element of transport charges into the cost of a proportion of the British iron ore used in pig iron manufacture. Even with a transport charge of 8s. a ton, Northampton ore can compete successfully with Cleveland ore at Middlesbrough.\* In the case of one firm engaged in pig iron production, railway carriage on materials is stated to have amounted to 7s. a ton in 1913 and 10s. 2½d. a ton in 1924. In other cases transport charges on materials bulk much larger. The National Federation of Iron and Steel Manufacturers have given the Committee examples in which they ranged from 17s. 5d. a ton in the case of pig iron to 46s. 3d. a ton in the case of tinplates.

For a detailed discussion of railway transport charges as a factor in cost reference should be made to page 493 *et seq.* of the volume "Factors in Industrial and Commercial Efficiency."

#### *Royalties on materials.*

Royalties vary so greatly in the methods of assessment and in amount that it is difficult to estimate their cumulative effect on the cost of materials. In the case of coal mining they appear to be based for the most part on fixed sums per ton of coal raised, and, while it is possible that increased royalties are being obtained as leases expire, there is no evidence of a general revision of rates. In the figures of Coal Mining in Table 1 of Appendix I, royalties amounted to 5·35d. per ton in 1913 and 6·33d. per ton in the period May to July, 1925, and accounted for 4·71 per cent. of the total cost of production in 1913 and for 2·93 per cent. in the later period.

It was stated in evidence that in the Cleveland district the royalties payable by ironmasters in 1925 were approximately 6d. per ton on ironstone and 6d. per ton on coal, and that as some  $3\frac{1}{2}$  tons of Cleveland ironstone are smelted to yield a ton of pig iron and some 4 tons of coal are needed to convert the ironstone into finished steel, the royalty cost in a ton of finished steel was estimated at slightly less than 3s. 6d.

In relation to hematite iron ore and ores of certain non-ferrous metals, it is usual for royalties to be assessed on sliding scales which rise with selling prices. An example of a sliding scale of royalty rents was given in the report (Cd.9071) of the Committee on the Iron and Steel Trades after the War (1918). Under that scale the royalty on a ton of iron ore would be 3s. 6d. when the price of the ore delivered

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\* Report of the Secretary for Mines for 1923, page 25.

into trucks at the nearest station was 17s. 11d. per ton (the average price of British hematite ore in 1913) and 5s. 2d. when the price of the ore was 21s 9d. per ton (the average price of 1924). It is possible, therefore, though the information is not conclusive, that royalty payments in connexion with hematite ores have increased to a greater extent than those on coal.

#### *Changes in articles of manufacture.*

In consequence of the changes in the style and design of manufactures, Materials costs per unit of production do not necessarily reflect the full extent of the increased cost of the materials concerned. Thus, in boot and shoe manufacture the increase in Materials cost per pair of boots or shoes will be seen from the examples given in Table 21 of Appendix I (page 149) to range from 62 to 85 per cent. The boots and shoes produced in 1924 as compared with 1913 were stated in evidence to be in some cases so different in character that less and sometimes different materials were used in their construction. The extent of the changes is reflected in the varying rates of increase in Materials costs. Similarly, changes in design and construction in engineering have facilitated more economical use of material in many productions, and are reflected, for example, in the increase of only 15 per cent. in the Materials cost of Heavy Oil Engines shown in Table I3 of Appendix I.

#### **Wages and Salaries.**

Of the two elements composing the head of cost Wages and Salaries, Wages is by far the greater in volume and therefore in its effect on the total cost of production. Moreover, as will be seen later, Wages costs and Salaries costs per unit of production have in many instances increased at very differing rates. For these reasons it is convenient to consider them in detail separately. Unfortunately, it is not always possible to obtain separate figures, and where separate figures are given it is by no means clear that the pre-war figures are in all cases strictly comparable with those of the post-war period. In particular, as mentioned on page 75, there is reason to believe that in some cases the remuneration of such office staff as is paid weekly is included in Wages, and that in other cases staff which was recorded as wage-earning before the war and its pay included in Wages is since the war regarded as salaried staff and its remuneration recorded under Salaries. If due regard is paid to those disturbing factors, however, comparisons of pre-war and post-war figures of Salaries and Wages respectively may fairly be made on the basis of a number of the separate figures in the Committee's possession. It is assumed that in the available statistics Wages costs include all payments for labour directly or indirectly employed in production.

#### **WAGES.**

Rates of wages and hours of work have already been dealt with in some detail in the "Survey of Industrial Relations," published by

the Committee. For the purposes of this chapter, therefore, it will suffice merely to call attention to four important points that are there brought out, viz :—

- (a) The differing increases, over pre-war levels, of rates of wages in the various industries, those in the trades most exposed to foreign competition showing as a rule a smaller rise than those in industries of the more sheltered type.
- (b) The differing rates paid in some instances to similar classes of workers in different districts, which, other things being equal, have the effect of making the cost of production vary as between districts.
- (c) The relatively high increase in the rates of wages of unskilled workers, which, other things being equal, enhances the increase in the wages cost per unit of production where a large proportion of such workers are employed.
- (d) The reduction of working hours which took place in the years immediately following the war. In almost all cases these were subject to the condition that weekly time-rates should not be reduced. For workers paid by the hour either the time rates were enhanced in the proportion in which the weekly hours were reduced, or the reductions in hours were accompanied by increases in hourly rates which resulted in net increases in weekly wages. Those paid at weekly, daily or shift rates generally continued to receive the same amounts as before the change. In some industries no general change in piece-work rates was made ; in others the piece-rates were enhanced, in some cases in proportion to the reduction in hours and in others by smaller amounts

*Relative increases in wages, earnings and Wages costs.*

In the following Table C certain time rates of wages for a full week and weekly earnings in 1925, extracted, except where otherwise stated, from the information from official sources published in the "Survey of Industrial Relations," are shown respectively in columns 1 and 2 expressed as percentages of the corresponding rates and earnings of, generally, August, 1914. In column 3 are shown the same wages per hour, also expressed as percentages of the corresponding pre-war figures, and alongside the adjusted percentages of wages are set out in column 4 some specimen Wages costs per unit of production, extracted from the data collected by the Committee, expressed as percentages of the similar pre-war costs. In most cases the pre-war figures on which these column 4 percentages are based are those of the year 1913, but inasmuch as there were for the most part only slight variations in wages in the year before the war there is every reason to believe that the percentages shown are not substantially affected by the base being 1913 instead of 1914.

## COSTS OF PRODUCTION.

TABLE C.

*Comparison of the increase in Wages Rates, Weekly Earnings and Wages Costs respectively in certain cases.*

*Note*—The figures of Columns 1 to 3, being based (except where otherwise stated) on the information from official sources published in the "Survey of Industrial Relations" issued by the Committee, are subject to the qualifications set out in that volume. In particular, it should be noted (a) that the figures of wages rates in Column 1 are based on the wages of particular classes of employees in a number of centres, and those average rates may differ from the wages rates paid by the undertakings submitting the cost figures, (b) that the figures of earnings set out in Column 2, in so far as they are based on the average earnings of sample groups of workpeople, are not necessarily precisely correct for the workpeople of the particular undertakings from which the cost figures were obtained, and (c) that the working hours in the particular undertakings may have differed from those on which the figures of Column 3 have been calculated.

Industry.	Time rates of Wages for a full week at 30th June, 1925, (Similar rates at August, 1914 = 100)	Weekly earnings in 1925 (1914 = 100),	Hourly time Wages, i.e. figures of Column 1 adjusted for decrease in working hours** (1914 = 100)		Specimen Wages Costs of 1925* (Pre-war = 100).	4.
			2.	3.		
<i>Boots and Shoe Manufacture.</i>						
Men—Hosiery and Stock and Shoe Rooms	211	220	230	238	228	
Other Departments	200	200 to 212	218 to 231	218	260	
Women	..	..	..	..	189	
Average earnings of over 50,000 workpeople in week ended 23rd May, 1925, as compared with average earnings at July, 1914	161	185 to 190	186	194	193	
<i>Ready Made Clothing.</i>						
Men	188	195	216			
Women	207	215	216			
<i>Cotton Industry.</i>						
Spinning and Weaving	..	..	..	..		
Average earnings of nearly 90,000 workpeople in week ended 23rd May, 1925, as compared with those of 113,000 workpeople at the corresponding date in 1914.	145	145	145	145	145	
<i>Engineering.</i>						
(Average of recognised district time rates in 16 centres)	..	..	..	..	..	
Fitters and Turners	..	..	..	..	..	
Ironmoulders	..	..	..	..	..	
Fattermakers	..	..	..	..	..	
Labourers	..	..	..	..	..	
<i>Agricultural Machinery.</i>						
Mean	165	165	165	165	165	
Direct Wages	..	..	..	..	..	
Indirect Wages	..	..	..	..	..	
All Wages	..	..	..	..	..	
<i>Locomotive Construction.</i>						
Mean	165	165	165	165	165	
Direct Wages	..	..	..	..	..	
Indirect Wages	..	..	..	..	..	
All Wages	..	..	..	..	..	

Marine Engines, Etc., Table 12.		195
All Wages	156 4	
Condenser Plant, Table 13.		154
Direct Wages	152	
Indirect Wages	172	
All Wages	160	
Baking Press, Table 13.		203
Direct Wages	207	
Indirect Wages	275	
All Wages	215	
Heavy Oil Engines, Table 13.		126
Direct Wages	122	
Indirect Wages	125	
All Wages	125	
Spinning Frame, Table 13.		193
Direct Wages	197	
Indirect Wages	195	
All Wages	195	
Medium Sized Engine, Table 13.		153
Direct Wages	153	
Indirect Wages	193	
All Wages	165	
Pedal-Bicycle, Table 13.		171
Direct Wages	231	
Indirect Wages	186	
All Wages	186	
Shipbuilding, Table 15		146
All Wages	135	
Mean	153	
	157	
	163	
	181	
Shipbuilding (Average of recognised time rates in nine principal centres)		
Sailwrights and Painters.	135	
Riveters	138	
Snap-Joners	144	
Labourers	168	
Time Workers		
April, 1924	165 3	167 7
October, 1924	167 3	167 2
October, 1925	170 3	171 5
March, 1926	170 0	175 4
March, 1927	169 7	178 3
At other dates the corresponding figures of average earnings were (1914 earnings = 100)		
	172 0	
	172 3	

\* In some cases the comparison made relates to the years 1924, or 1923 as will be seen in the detailed Tables.

† The figures of cols. 1 and 4 in the case of Ready-Made Clothing are based on minimum time rates applicable to the lowest paid grades of adult workers.

‡ Based on information supplied by the Engineering and Allied Employers' National Federation.

§ P by R = Payment by Results.

|| At other dates the corresponding figures of average earnings were (1914 earnings = 100)

Time Workers

Workers Paid by Results

165 3

167 3

170 3

171 5

175 4

178 3

172 0

172 3

173 7

167 2

171 5

175 4

178 3

172 0

172 3

173 7

167 2

171 5

175 4

178 3

172 0

172 3

173 7

167 2

171 5

175 4

178 3

172 0

172 3

173 7

† Average weekly earnings in March, 1925, of men 21 years of age and over employed by 1,669 firms employing 323,888 men compared with the corresponding average earnings in July, 1914, of similar men employed by 950 firms employing 251,383 men.

Titfers

Turners

Moulders

Patternmakers

Labourers

All classes

It will be seen that, in many of the cases set out in the Table, there are substantial differences between the percentage increases over pre-war of wage rates per hour and Wages costs. These differences result from the interplay of a number of factors, some of which have tended to increase Wages costs per unit of production, while others have tended to decrease them.

In the first place it must be remembered that as an element in the cost of production, Wages include all extra pay of any kind, and it is often earnings rather than wage rates that determine Wages costs. The examples in columns 1 and 2 show that in some cases payments for labour as reflected in the figures of average earnings had in 1925 increased to an appreciable greater extent than weekly time-rates. Average earnings in the manufacture of boots and shoes appear to have been increased over their pre-war level between 10 and 20 per cent. more than minimum wage rates ; in the cotton trade average earnings appear to have been increased roughly 20 per cent. more than rates of wages ; while in engineering also the figures of average earnings show a greater percentage increase than wage rates. For these results there are a number of contributory causes.

It may be that total earnings of time workers, including extra pay, overtime, nightshift and other allowances, have increased to a greater or a less extent than wage rates by themselves. The indications are that it has been to a greater extent. Thus, it will be seen from the figures supplied by the Engineering and Allied Employers' National Federation that the total earnings of time workers were increased on account of such payments appreciably more than time wages. Such a result would follow, for instance, if a greater proportion of overtime, paid for at a higher rate than ordinary time, was worked in 1925 than in 1914 ; and it may be that the general shortening of the normal working day has led to an increase in the proportion of overtime worked.

Moreover, a large and increasing proportion of workpeople are paid not at time rates, but by results, and their remuneration on that basis, if the indications of the Engineering figures referred to are correct, would appear to have increased to a greater extent than the remuneration of time workers. On an average the workers paid by results in that industry secured in March, 1925, an increase over their pre-war earnings 4.5\* per cent. higher than the increase enjoyed by time workers.

#### *Effect of changes in personnel.*

Again, in the interval that has elapsed since 1913 there have been many changes in the personnel employed in industry, changes which

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\* Figures as at certain other dates are given in the footnote to Table C on page 93.

have not been without their effect on the relative levels of wages and earnings and on Wages costs. Thus, owing to the decrease, in the period between the Census of 1911 and that of 1921, of roughly 75,000 in the number of children under 14 years of age engaged in industry in Great Britain, and to the loss by the older industries of young recruits to newer, less depressed and possibly more attractive occupations, (such as e.g. the motor and cycle trades, which, according to the Census of Production figures, employed an average number of 200,272 persons in 1924 as compared with an estimate of about 92,000 in 1912 and with 53,639 in 1907, the number of workers under 18 years of age being 27,462 in 1924 as compared with 9,013 in 1907) there is a general tendency for a smaller proportion of juveniles to be employed in the older and more depressed industries. This tendency is most marked in the textile trades, and it is interesting to note that the Census of Production figures show that, while the average number of persons employed in cotton-spinning and weaving in 1907, viz. 572,062, fell to 517,232 in 1924, the whole of the 10 per cent. decrease (apart from a very small decrease in adult males) was confined to persons under 18 years of age.

Similarly, costs are affected in some cases by the employment of differing proportions of men and women. This change does not, of course, manifest itself in the heavier and more arduous occupations, but in the lighter trades it may exert a definite influence on Wages costs. Thus, in the boot and shoe trade the proportion of female workers to the total average number employed increased according to the Census of Production figures from 28 per cent. in 1907 to 35 per cent. in 1924. Similarly, the results of the population Census show that the percentage of women engaged in the trade in Northamptonshire and Leicestershire had grown from about 32.2 per cent. of the total in 1911 to 35.4 per cent. in 1921. The tendency these figures show for the women's share of employment in the trade to increase is no doubt due in part to the changes that have taken place in the style of boots and shoes manufactured.

There are yet other movements which may appreciably affect Wages costs, namely, those between skilled and unskilled workers. The extent of these is very difficult to gauge. Improvements in methods and the introduction of labour-aiding devices may result in the employment here of fewer skilled workers, there of fewer unskilled. It appears, however, that in times of depression, such as prevailed in many of the industries to which the post-war cost figures relate, there is a tendency in some industries for the services of workers of special skill to be retained longer than those of less skilled employees. Where that tendency operates Wages costs are increased by reason of being composed of a larger proportion than normal of the higher rates of pay.

*Effect of changes in goods produced.*

The factors already discussed are probably insufficient by themselves to account for the differences between the figures of pay per hour worked and those of Wages costs.

One important reason for the disparity is to be found in the differences that exist between articles as produced to-day and in the pre-war period. The great change in the style, for example, of boots and shoes has meant that in their production more labour is expended, especially on the uppers.\* Hence the Wages costs per unit of production in some of the factories concerned as set out in the Table have risen to an appreciably larger extent than the earnings of the workpeople per hour, though it may be that the disparity is accentuated by other factors.

In other trades there have been changes in the direction of simplification or improvement, as for example, in the case of the electric motor of the same horse power as a standard type manufactured in 1913, which was produced at an increase in cost of only 45 per cent., whereas an exact replica of the earlier model would have cost 70 per cent. more than before the war. (cf. Table 14 of Appendix I, page 142). A somewhat similar change is observable in the case of motor cars and motor cycles.

*Effect of changes in methods, etc.*

Not less important in their bearing on Wages costs are the improved methods of production, better layout of factories and works and the more extensive use of labour-aiding devices, each of which results in a larger output per unit of labour employed. The changes in these matters appear to have exerted a marked effect on Wages costs in some instances. In the iron and steel industry, for example, mechanical means have been introduced of performing many operations previously carried out by hand labour. The number of men employed at the blast furnaces in 1923 had fallen, compared with the average number employed in 1920, by 32.1 per cent., while the output per employee had increased by 35.9 per cent. Similarly, in steel smelting and rolling the number of workers employed in 1923 was 65.6 per cent. only of the number employed in 1920, while the output per man was increased by 37.2 per cent. It was stated in evidence that these results were due in large measure to the development of plant and its high productive capacity. In the wire trade it is now possible by the use of improved machinery to draw wire several stages in one operation, whereas formerly it

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\* Largely as the result of the introduction of short skirts, women's shoes have become much more an article of fashion.

was drawn only one stage at a time. It was stated in evidence also that in some parts of the engineering industry the amount of work demanded on a job to-day may differ very materially from what it was pre-war owing to the development of machinery and the provision of mechanical aids. Improved methods have also played a great part in the manufacture of motor cars and motor cycles and have, together with the improvement of design, resulted in the production of improved models at costs approximating to, or even less than, those ruling in pre-war days. In the cycle trade too, it is possible to produce bicycles, stated to be improved in quality, for sale at prices within 10 per cent. of the average price in 1914.

In the production of the electric motor referred to above, the manufacturers state that, although the earnings of their workpeople had increased substantially to the same extent as the cost of living, it had been possible by improvements of methods and by speeding up of processes to effect economy in the labour cost per unit of production, with the result that it showed an increase over pre-war of only 36 per cent.

#### *Effect of reduced hours of labour.*

The question whether the reduced hours of labour have resulted in increased Wages costs is one on which the evidence shows difference of opinion.\* On the one hand it is claimed that the shortening of the period of work leads to greater efficiency and improved output, on the other hand it is asserted that production per hour worked has not increased. It is clear from the evidence that the effects of the reduction have been very different in the different industries. There appear to be cases, in industries where the machinery employed imposes no limitation on the rate of output, in which owing either to more intensive work or to better time-keeping, the weekly output per worker has been little, if at all, diminished by the change, while where, as in the iron and steel industry, there have been great improvements in plant and mechanical power output has been actually increased. The Wire and Wire-Netting Manufacturers, for example, stated in evidence that the wire drawers were keeping better time and that consequently they were working as long as before, while standardisation of processes and improved machinery had resulted in a larger production per man than formerly. It is stated, however, that in some industries production per hour could not be increased because the machinery employed was already working at its maximum effective speed. To a large extent this has been the position in the cotton trade, and it has not been possible to accelerate production in that industry

\* The discussion relates mainly to time workers. In so far as piecework rates were enhanced when hours were reduced, wages costs per unit of production were proportionately increased.

following on the reduced hours of working. The same position is stated to have arisen in, e.g. the woven wire trade and in some parts of the engineering industry. In such instances, so far as time workers are concerned, the effect of the reduction in working hours, considered by itself, has been to increase the Wages cost of production, though other factors may have tended to counteract this effect.

#### *Effect of efficiency of labour.*

Finally, as a cause of the difference between the percentage increases in pay per hour and in Wages costs, there is the factor of the efficiency of labour. The information laid before the Committee does not indicate that that factor has changed sufficiently in the interval to exert anything but a relatively small effect on costs, but it was stated in evidence that, in some industries at least, efficiency was not quite at its pre-war level. It seems clear, however, that apart from any effects of the dislocation of the war that may yet linger (such as the employment in industry of a large number of partially disabled men), the long period of depression in trade cannot fail to have some prejudicial effect on the skill and energy of the workers. Prolonged periods of unemployment or under-employment must of themselves tend to reduce efficiency, while the fear of unemployment when the job in hand is finished must often have its effect. In the post-war period, too, there is a much larger proportion of older men engaged in industry than before the war, and it may well be that in occupations in which quickness and physical strength are needed the average efficiency is somewhat impaired thereby. The total number of males of all ages engaged in industry and trade in England and Wales\* at the Census of 1921 was roughly 12,100,000, an increase of 659,000 over the number in 1911, yet at the later date there were over 839,000 more men aged 45 and over employed than in 1911, of whom no less than some 414,000 were aged 55 or over. It is interesting to note in this connexion that, as set out on page 72 of the "Survey of Industrial Relations," issued by the Committee, while the male population as a whole will be increasing in the years up to 1931, the numbers surviving to ages of 65 and over will be increasing and the adolescents decreasing.

#### *Indirect Wages.*

The wages of workers directly engaged in production and the indirect wages of handling, storekeeping, supervision, transport,

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\* The male population of Scotland gainfully occupied increased from approximately 1,474,000 in 1911 to 1,543,000 in 1921, or by roughly 69,000, while the occupied men 45 years of age and over had increased in numbers by nearly 90,000.

power staff, etc., vary greatly in their relative importance one to another and in their respective effect on total Wages costs. The wages of production are, very largely, paid only as long as there is work to do, and their amount per unit of output is capable of more or less precise estimation. To a large extent, however, the indirect wages have to be paid so long as even a skeleton labour force is maintained, no matter how small the output may be. In times of depression, therefore, it is natural that Indirect Wages costs should bulk more largely than at other times. The Committee have for the most part been supplied with total Wages figures, which they are unable to divide between Direct and Indirect Wages. Where separate figures are available they indicate that where works were employed in 1924 to a considerably less extent than before the war, as in, e.g., a Medium Sized Engine (page 141), a Baling Press (page 140), Agricultural Machinery (page 137), Locomotive Construction (page 138) and Men's Underwear (page 147), the increase in Indirect\* Wages costs was for that reason decidedly heavier in most cases than that in Direct Wages costs.

#### SALARIES OF MANAGEMENT, ETC.

The tendency for the relative importance of Salaries costs to vary with the extent to which productive capacity is actually employed is even more marked than in the case of Indirect Wages, inasmuch as the cost of management and of canvassing for orders are virtually fixed charges which cannot be escaped except by closing the undertakings.

In considering the figures of Salaries costs generally it is necessary to bear in mind that, apart from the tendency already remarked upon to classify as salaried workers in 1924 employees who were described as wage earners in 1913, there are various reasons why Salaries costs may be increased. The expansion of undertakings must often in itself be responsible for a certain increase in Salaries costs over pre-war until such time as the increase in productive capacity is brought into active use. Increases in Salaries costs may also result from, e.g., the more extensive use of costings and their improvement, and the growing tendency in some branches of industry for

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\* The wages of maintenance staff, in cases where firms carry out their own maintenance work, are not included in Indirect Wages, but appear in the Tables under the heading Depreciation and Maintenance, which covers the entire cost, including both wages and materials, of such work.

manufacturers to set up their own selling organisations\* so as to sell direct to their customers instead of through middlemen. Moreover, as mentioned at page 58 of the volume "Factors in Industrial and Commercial Efficiency," it has been represented to the Committee that the remuneration necessary to obtain the services of higher staff and outside experts has been materially raised by the fact that the recipients are subject to heavy income tax. It must be remembered, too, that those responsible for management and control of industry are not necessarily less busily employed when trade is slack than when it is active. It is at such times that they must make their greatest efforts to secure employment for their undertakings, to steer them through altered and more difficult circumstances, and to conserve their resources and vitality against the day when trade revives again. For these reasons the proportion borne by Salaries to total cost must usually be greater in times of depression than in times of normal or active production. The Committee's information suggests that, except where the under-employment of undertakings results in Salaries costs assuming greater magnitude per unit of production, those costs generally have not increased more than Direct Wages costs, although there are substantial differences in individual cases, as would be expected from the circumstance that there is no normal ratio between salaries and wages respectively. In Table D opposite it will be seen that in the case of Heavy Oil Engines, of Dyes, and of Cotton Spinning, Salaries costs had increased to, roughly, the same extent as Wages costs. In the case of Household Soap and the production of a Spinning Frame, they show an increase decidedly below that in Wages costs. In other cases, e.g. the manufacture of Gas, Basic Pig Iron, Steel Ingots, Steel Billets, Baling Press, Medium Sized Engine, Pedal Bicycle, Hosiery, and Boots and Shoes, Salaries costs had risen much more than direct Wages costs, but with a few exceptions the Salaries in these cases were spread, as shown in the Table, over a much smaller output than in the pre-war year.

It may be added that, according to the evidence laid before the Committee on behalf of the railway companies, the remuneration of salaried railway staff had increased in 1924 by 98 per cent. over its pre-war level, while the average increase in the wages rates of all railway wages grades except shopmen was 125 per cent.

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\* The cost of separate selling organisations, where particulars of such have been furnished, is included in the Tables under the heading of Other Charges. It is to be expected, however, that the maintenance of such an organisation is not without its effect on the charges recorded under Salaries.

TABLE D.

*Comparison of the Increase in Wages and Salaries Costs respectively in certain cases.*

Table	Reference.	Wages Costs (Pre-war = 100).	Salaries Costs (Pre-war = 100).	Extent to which Works, &c., were employed† (Pre-war extent = 100).
1	Coal Mining .. .. ..	185	266	†
3	Gas .. .. ..	183	194	121
6	Basic Pig Iron .. .. ..	166	237	71
6	Steel Ingots .. .. ..	160	201	68
6	Steel Billets .. .. ..	201	320	96
6	Common Billets and Sheet Bars .. .. ..	208	278	†
8	Wire .. .. ..	192	186	†
8	Wire Netting .. .. ..	161	179	†
12	Marine Engines, &c. .. .. ..	195	244	46
13	Baling Press .. .. ..	215	286	78*
13	Heavy Oil Engines .. .. ..	125	125	94
13	Spinning Frame .. .. ..	195	171	†
13	Medium Sized Engine .. .. ..	165	293	55
13	Pedal Bicycle .. .. ..	186	215	90
16	Dyes .. .. ..	276	275	†
16	Household Soap .. .. ..	272	189	94
17	Cotton Spinning, A .. ..	197	200	†
17	" B .. .. ..	194	189	†
18	Cotton Weaving, A .. ..	204	261	86*
18	" B .. .. ..	197	144	†
19	Hosiery—Men's Underwear .. ..	167	283	52
21	Boots and Shoes .. .. ..	189	281	118

\* The figures stated are percentages of the pre-war output. It is not known whether the productive capacity had been increased in these cases.

† Not stated.

‡ The figures in this column represent, except where otherwise stated, the percentage change in the ratio of actual to potential production as shown in the detailed Tables on pages 124 *et seq.*

### Other Expenses.

It will be seen from the specimen cost figures in Table A that Other Expenses per unit of output have advanced at very different rates in the several cases. To some extent that is accounted for by the variations in the relative importance of such items as rates and social charges, which have increased greatly, and electric power, which has shown a very moderate increase. The differences reflect, moreover, the varying circumstances of the several undertakings in regard to location, maintenance, depreciation, etc., as well as the combined effect of the general changes that have taken place since the year before the war in power, in equipment, in factory premises,

and in the size of undertakings. It must be remembered also that in so far as the particulars tabulated relate in some cases to the production of a particular article or the output of part of a factory, the comparison of the overhead charges in a pre-war and a post-war year may be affected by the adoption of differing methods of apportioning those charges among the various departments or the various articles produced.

*Inelasticity of Other Expenses.*

Other Expenses comprise to a large extent items of expenditure which do not vary to an appreciable degree with the quantity of goods produced. Some of them, indeed, such as property tax, local rates and depreciation of plant, machinery and buildings are virtually fixed charges which have to be met without regard to output. Repairs and maintenance, too, represent expenditure which, while it can to some extent be postponed for a time, must for the most part be regularly met if deterioration is to be avoided and future production relieved of an added burden on account of it. This inelasticity of Other Expenses is the principal reason for their very widely varying increases per unit of production. Thus, in the following examples extracted from the specimen cost figures of Engineering in Appendix I, it will be seen that, with one striking exception, the Other Expenses increase in magnitude per unit of production as the extent to which the works are employed diminishes.

Reference	Extent to which works were employed (1913 extent = 100).	Other Expenses per unit of production in post-war period.			
		Total (1913 = 100).	Power, etc (1913 = 100)	Depreciation, etc. (1913 = 100).	Rates, etc. (1913 = 100).
Heavy Oil Engines ..	94	137	116	103	223
Pedal Bicycle ..	90	185	161	232	354
Baling Press ..	78 *	292	267	285	400
Medium Sized Engine	55	249	216	194	388
Marine Engines, etc.	46	179	106	209	205
Agricultural Machinery	45 *	309	—	—	—
Locomotive Construction.	37 5	320	—	—	—

\* The figures stated are percentages of the 1913 output. It is not known whether the productive capacity had been increased in these instances.

In other cases the effect of diminished output on the rate of increase in Other Expenses per unit of production is not always clearly indicated by the figures, inasmuch as there are other factors at work, such as varying amounts of repairs and maintenance work, which disturb comparisons.

*Extensions and improvements of capacity and plant.*

It should be borne in mind that a diminution in the ratio of actual to potential production in the post-war year as compared with the pre-war year does not necessarily imply that the output is smaller. During and since the war many undertakings have been extended and equipped with the most up to date plant, machinery and labour-aiding devices. Thus, the steel industry has increased its productive capacity by some 50 per cent., and the new furnaces and rolling mills are stated to be of the highest efficiency. In the heavy chemical industry progress has also been great and British ascendancy in the industry remains unassailable. The productive capacity of the engineering industry, too, has increased by leaps and bounds with the progress of applied science. How great is the advance in the provision of mechanical power in industry is shown by the reports of the 1924 Census of Production.\* In the coal mining industry, for example, the total horse-power of engines in the undertakings covered by the returns had grown from 2,293,256 in 1907 to 3,341,460 in 1924, when in addition electric motors of a total horse-power of 538,221† were driven by purchased electricity. The greater part of the increase had taken place between 1912 and 1924, since the figures of 1912 showed an increase of only some 10 per cent. over those of 1907. At the blast furnaces, smelting, rolling and foundry works, including associated bye-product works, the total engine horse-power had grown from 1,383,320 in 1907 to 1,814,520 in 1924, apart from electric motors totalling 475,850 horse-power driven by purchased electricity. At tinplate works the increase in horse-power, apart from that driven by purchased electricity, was from 68,842 to 101,515. The boot and shoe trade had in 1907 engines totalling 19,890 horse-power, and in 1924 totalling 30,144, while electric motors driven by purchased current accounted for a further 32,519 horse-power. Between 1912 and 1924 the cycle and motor trades increased the horse-power of their machinery from 37,766 to 194,157. These large increases in machinery reflect in part the great advances made in the mechanisation of industry—resulting in an increase in the horse-power of machinery available per person employed—and in part extensions of productive capacity.

All such improvements and extensions, whatever may be their ultimate effect in increasing efficiency, bring with them additional charges for maintenance, depreciation, rates and property tax. In so far as labour-aiding devices and improved layout of plant are concerned the increase in overhead costs may be in particular cases

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\* For fuller details on this subject, see Chapter I, page 45.

† The horse-power of motors driven by purchased electricity was not required to be stated at the Census of 1907, but it appears to have been negligible compared with the total engine power in industry as a whole, though no doubt the position varied considerably as between different industries.

partly, wholly, or even more than counterbalanced by the saving in Wages costs. In other cases an increase in the volume of output has helped to lighten the burden of overhead charges per unit of production. In the main, however, there is little doubt that the vitality and enterprise evinced by industry in improving its capacity and efficiency have added to its burdens in the time of depression. Even when trade revives and full time working is again attained, there may be cases where the burden of overhead charges per unit of output will be affected by the impossibility in those cases of finding compensation, by speeding up or otherwise, for decline in output following the post-war reduction of normal working hours.

#### *Maintenance.*

The post-war cost of repairs and maintenance work, like that of renewals and replacements, is high, and the burden of this expenditure on production has therefore been heavy. The burden has been made more heavy by reason of the slackness of trade, since the charges incurred have had to be spread over an output small in relation to the potential output. Moreover, the greater mechanisation of industry and the extensions of productive capacity have resulted in there being more buildings, plant and machinery to maintain than in pre-war days, though, because of the comparative newness of many of the assets, the maintenance work has probably not been proportionately increased. It is natural, too, that a manufacturer who is faced with the necessity of carrying out large measures of repair and maintenance work will often put them in hand when his works are slack rather than wait until his factory is working at full capacity.

In the case of iron and steel furnaces and coke ovens there are, in addition to day to day repairs and maintenance, heavy charges for relining, which has to be carried out periodically. The annual expenditure on repairs and maintenance is therefore subject to great fluctuations which disturb comparisons.

#### *Depreciation.*

Depreciation charges differ from repairs and maintenance expenditure in that they do not ordinarily represent the amount of outgoings for replacements and renewals in the year in which they are charged. The annual setting aside of a provision for depreciation of assets is a measure designed to charge the production of each year with its fair share of the wastage of the assets, and thus to spread over their whole life the heavy cost of their renewal or replacement, which would, in many cases, form a crippling burden if it were to fall on the production of the years in which it was incurred. By reason of the much higher level of replacement costs obtaining since the war, depreciation based on pre-war values is in many instances insufficient to meet replacements as they become necessary, and it has therefore been expedient to make additional provision.

In cases where fixed assets were revalued at peak replacement prices, or where undertakings were purchased as going concerns at the high ruling values, depreciation is chargeable on the increased values, and is probably heavier than the sum of depreciation on the original values and of any special additional provision that would have been made in view of the level of replacement prices.

In those cases, of which some have already been mentioned, where extensions and improvements were carried out, these were frequently effected at very high capital cost. The additional burden of depreciation charges is heavier in consequence, and will, like that weighing on concerns with revalued assets, remain so until it is possible to write down the assets whose value under existing conditions is less than their cost or book value.

It should be mentioned, however, that while the high book values burden the total cost of production with heavy depreciation charges they have in some cases secured to the owners of the undertakings a correspondingly increased allowance of depreciation for income tax purposes.

#### *Power, Light, Water, Heating, etc.*

The charges under this heading include in some cases the cost of coal or other fuel used for heating and the generation of steam and power; in other cases the chief item is the cost of gas or electricity purchased, while in some instances both kinds of expenditure are incurred.

Great advances have been made in the utilisation of electric power, while largely increased use of electrically driven motors is shown throughout industry. The Census of Production shows that in coal mining the total horse power of motors driven by electricity had grown from 492,000 in 1912 to 1,568,360 in 1924. In the cycle and motor trades the horse power of electric motors used represented in 1924 over ten times that of the directly applied mechanical power. A large, and in some industries the greater, part of the electric power used in industry is generated by the industrial undertakings themselves, but the sale of current by authorised electricity undertakings for power purposes is rapidly increasing. In 1920-21 it amounted to 2,499 million units, in 1921-22 to 2,104.7 million, in 1922-23 to 2,548.5 million, in 1923-24 to 3,089.1 million and in 1924-25 to 3,532 million. The increased sale has been accompanied by large reductions in the average price charged. The average charge per unit sold for power purposes in 1921-22 was 1.69d., in 1922-23 1.30d., in 1923-24 1.14d., and in 1924-25 1.07d. Because, however, of varying levels of efficiency and differences in location and local factors, there is wide variation in the prices charged by the several undertakings. The prices charged

differ widely even between neighbouring areas. In the Rochdale district for example, the average charge per power unit in 1924-25 was 1.36d. in Todmorden, 1.09d. in Whitworth, 1.04d. in Rochdale, .99d. in Heywood, .85d. in Bury and 1.17d. in Radcliffe. In 1925 there were over 500 separate authorised electricity undertakings giving supplies. With the development of the great areas of distribution now in contemplation many of the large differences in price will presumably diminish or vanish.

The cost of producing gas varies greatly with the size and efficiency of the undertakings, their distance from the sources of coal and their facilities for the disposal of residuals. The prices charged to the consumer therefore vary within wide limits. In Sheffield the average charge per therm in 1925 was 6.2d., in Birmingham 6.9d., in Derby 7d., in Newcastle-on-Tyne 7.85d., in Bradford 8.6d., in Glasgow and in Oldham 9 2d. The charges of some of the smaller undertakings were appreciably higher, and as in the case of electricity, there are wide variations in the price of gas in neighbouring areas. In 1925 there were no fewer than 782 separate statutory gas undertakings in Great Britain, and although there is no far-reaching scheme of unification in operation, amalgamation of undertakings takes place from time to time, and the industry is pressing for amendments in existing legislation to facilitate co-operation and amalgamation between gas undertakings.

Some saving in fuel costs has been effected by reason of the more economical use of fuel. The gases and waste heat generated at blast furnaces and coke ovens, which formerly were in a large degree wasted, are now often used for general heating and power purposes in connexion with associated undertakings. In addition, as mentioned in Appendix III (page 160) owners of coke ovens sell bulk supplies of gas to authorised gas undertakings.

#### *Local Rates.*

Local rates and their importance in relation to the cost of production have been discussed by the Committee at some length in the volume, "Factors in Industrial and Commercial Efficiency," page 473, *et seq.* It is not proposed to recapitulate here the various points there dealt with. There are, however, two aspects of local rates to which it is appropriate to call attention.

In the first place it is necessary to bear in mind when considering local rates as an element in production costs that there have been great variations among different districts both in the degree of reassessment of properties and in the percentage increase of rates in the £ since 1913. The amount of rates in the £ varies widely not only as between districts widely removed, but even between

adjoining areas in the same district. In the Burnley district, for example, the 1913-14 and 1925-26 rates in the £ respectively were as follows :—

	• Rate per £.		1925-26 assessment value expressed as percentage of 1913-14 assessment value.
	1913- 14.	1925- 26.	
Colne M.B.	..	..	146
Barrowford U.D.	..	..	142
Nelson M.B.	..	..	158
Brierfield U.D.	..	..	135
Burnley C.B.	..	..	145
Padigham U.D.	..	..	135

While the information available does not indicate to what extent the increases in assessment values recorded in the last column of this table are accounted for by reassessment of properties or by growth in the property subject to assessment respectively, such examples as these show to what extent the location of a factory even within a given district affects the amount of local rates it has to bear, and how very different the percentage increases in local rates per unit of production may be, apart altogether from such factors as changes or extensions of premises.

Secondly, it is interesting to note that in times of prolonged trade depression, not only do local rates bulk larger as an element in the cost of production by reason of being spread over a small output, but they are actually increased by reason of the more extensive poor relief which results from chronic unemployment. The actual expenditure on poor relief in the populous poor law unions of England and Wales outside London\* in 1924-25 averaged 19s. 5d. per head of their population, of which roughly 8s † represented the cost of out relief, whereas in all other unions it averaged no more than 12s. 7d., of which some 4s. 7½d. was accounted for by out relief. In areas suffering most acutely from bad trade and unemployment, the expenditure per head of population was increased largely above the average of the populous unions. Thus, in Middlesbrough it was as high as 23s. 10½d. of which over 13s. was out relief, in Merthyr

\* Expenditure on poor law relief in the Unions in London in 1924-25 averaged 33s. 9d. per head of population, of which roughly 10s. 9d. represented the cost of out relief.

† The figures of out relief per head of population have been calculated from the data in Table 19 of the Local Taxation Returns, 1924-25, Part I, and take no account of repayments by persons in receipt of relief or by their relatives.

Tydfil 28s. 5½d. of which more than 19s. 6d. was out relief, in Newcastle-on-Tyne 30s. 9½d. of which nearly 19s. was out relief, and in Sheffield 34s. 10½d. of which some 17s. 6d. represented out relief. Such greatly swollen figures, themselves due in very large measure to depression in trade, are directly reflected in the level of local rates and directly add to the burdens of all industrial undertakings in the areas affected. How great that burden may be is illustrated by the fact that in 1924-25 the expenditure on relief of the poor, including Overseers' expenditure, accounted for 7s. 3½d. out of a total rate of 19s. 8d. in the f in Middlesbrough, for 8s. 7d. out of 24s. 4d. in Merthyr Tydfil, for 5s. 5d. out of 13s. 6d. in Newcastle-on-Tyne, and 5s. 4½d. out of an approximate average of 15s 5½d. in Sheffield.

#### *Social Charges.\**

Unlike local rates, social charges, which comprise National Health and Unemployment Insurance and Workmen's Compensation, do not necessarily assume greater weight as production diminishes since the State Insurance contributions are only payable in respect of employees actually engaged, and therefore, decrease in amount as the services of workpeople are dispensed with.

Where an undertaking cannot give full time employment to all its workpeople, the effect, in so far as the relation of State Insurance contributions to costs of production is concerned, varies according to the method of working. Where workpeople are "stood off" for a whole week or weeks at a time, or where the necessary number of workpeople only are employed full time and the remainder "stood off" entirely, each contribution payable is in respect of a full week's work. Where, however, short time is organised on a system whereby workpeople are employed on less than the full number of days in the week, the same contributions are payable as for a full week's work, so that State Insurance charges assume a larger ratio to the cost of production than if they were payable in respect of full time working. The same result follows where piece workers, instead of being "stood off," are given a reduced number of machines to tend, as in cotton weaving where an operative weaver may, in times of depression, tend only one or two instead of four looms.

#### **COSTS OF WHOLESALE AND RETAIL DISTRIBUTION.**

The cost of wholesale and retail distribution is important in that together with the cost of production it affects the level of retail prices in the home market, which, other things being equal, determines the effective spending power of the consumer and the home

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\* Much additional information in regard to social charges in relation to the costs of production will be found at page 476, *et seq.* of the volume, "Factors in Industrial and Commercial Efficiency."

demand for the products of industry. Moreover, by reason of agreements as to rates of remuneration, the level of prices as reflected in the Ministry of Labour cost of living index determines the rise or fall of the rate of remuneration of some 2,500,000 persons, including a large number in the employment of the central and local authorities whose pay is a charge upon public funds. (Cf. "Survey of Industrial Relations," page 109.)

The lines along which industry has developed and the rise of large retail businesses have led to great diversity in the organisation of distribution. The separate organisation of manufacture and of wholesale and retail distribution has in part given place to the system under which manufacturers maintain their own retail shops or adopt other methods of selling their produce direct to the consumer. Such methods have been adopted, for example, in the boot and shoe trade, and it is stated that the manufacturers in that industry who undertake the marketing of their products have been highly successful. In the clothing trade direct selling to retailers is usual, and there has been a development in the direction of retail trading by the manufacturers. The largest clothing factory in the country, for example, is understood to sell its products exclusively through its own shops. Moreover, the larger retail undertakings of the present day are able to buy some of their goods on as large a scale as does the wholesale house. This circumstance has led to a large extension of the practice of buying direct from manufacturers and to the establishment of buying agencies to replace in part the work of the wholesale traders. The present position is, therefore, that purely wholesale businesses and purely retail businesses work alongside, and in competition with, undertakings which combine, in whole or in part, both wholesale and retail business, and sometimes undertake manufacture as well as distribution. This complexity of organisation leads to a certain difficulty in ascertaining what in fact is the cost of distribution, since the transactions and results of wholesale or retail traders may not be representative of distribution as a whole.

#### *General factors affecting the cost of distribution.*

The cost of wholesale and retail distribution is related to the work done, to rapidity of sales and to the risks run.

The services rendered vary according to circumstances, and would appear to be increasing. The wholesale drapery trade, for example, has more and more to keep in touch with retail shops through travellers. Again, wholesale houses are increasingly including in their services delivery to the shops. In the retail trades, and in particular in the provision trade, there is an increase in the sale of packet goods made up by the manufacturers or wholesalers ready for retail disposal. The public are more and more having

their purchases delivered, and in the wholesale and retail trades generally the customers have the wares on offer placed before them by catalogues, circulars, and price lists.

The rapidity of turnover of stocks, which varies greatly from trade to trade, and, to a smaller extent, between establishment and establishment in the same trade, is important in that a quicker turnover enables a smaller margin of difference between cost and selling prices to yield an equally satisfactory return on the capital employed, and at the same time reduces the risks arising from fluctuations in price and demand.

In so far as wholesale and retail traders carry stocks or buy forward, they provide for a time the capital without which the process of supplying the needs of the consumers would come to a stop, and during that period they take the risks of fluctuation in price and demand. There are risks, too, of bad debts, and others particularly affecting certain trades, such as those of deterioration of stocks, of changes in fashion, or of the coming of abnormal weather.

#### *Variations in distributive costs in certain trades.*

As would be expected,\* therefore, the cost of distribution varies considerably from trade to trade, and the differences are accentuated by the fact that in some trades there is often no wholesale distributor between the manufacturer and the retailer. Examples of such trades are agricultural machinery, where the retailer is stated to work on a margin of from 15 to 20 per cent. on sales ; boots and shoes, where his margin ranges normally between 25 and  $33\frac{1}{3}$  per cent. ; ready-made clothing, in which his margin was found in 1919 at the time of the Standard Clothing Scheme to be 25 per cent. ; and motor cars, where his margin was stated in 1926 to vary from  $12\frac{1}{2}$  per cent. to 20 per cent. Wholesale merchants, known in this case as factors, are employed in the distribution of spare parts, accessories and tyres for motor vehicles, the factor's share of the final selling price being some  $12\frac{1}{2}$  per cent., while that of the retailer is usually  $17\frac{1}{2}$  per cent. In regard to tyres, however, some manufacturers supply retailers direct and allow them a margin of 20 per cent. or over. In the woollen trade, where, as in textiles generally, both wholesalers and retailers take part in distribution, a margin of  $12\frac{1}{2}$  to 15 per cent. on returns is regarded as a reasonable one for the wholesaler, while the retailer's margin has been stated as  $33\frac{1}{3}$  per cent. In the carpet trade wholesalers' margins are about 10 per cent. and retailers in the neighbourhood of  $33\frac{1}{3}$  per cent. The percentages stated do not, however, necessarily represent the full extent of the margin obtainable by the retailers. For instance, in most trades, bills for goods supplied to retailers are payable in full only after the lapse of a certain period, and discounts amounting to  $2\frac{1}{2}$  per cent. are generally allowed for prompt payment.

Further, in some trades, notably in the motor and motor cycle trades, the margins are increased in many cases by the granting of rebates depending on the amount of sales effected.

In the heavier industries such as iron and steel, merchanting costs are low because it is usual for the manufacturers to sell direct to the users. In the dyestuffs industry also probably well over 90 per cent. of the sales are made direct to the users. Metallurgical coke, too, is usually sold direct, but foundry coke, which is sent longer distances than metallurgical coke and generally has a much more scattered market, is for the most part sold by the makers to (or through) merchants.

*"Gross margin" and "mark up."*

In considering the difference between the cost of goods to the distributor and the price at which he sells them to the public it is necessary to discriminate between what is usually termed the "gross profit" of the distributor, referred to in this Chapter as his "gross margin," and the "mark up" he employs in order to arrive at his margin. "Mark up" is the amount, usually expressed as a percentage of selling price, added to the cost price of goods in fixing the price at which they shall be offered for sale, whereas the "gross profit," also usually expressed as a percentage of the total sales, is the realised margin between the cost to the retailer and his selling price. It is possible that in some businesses it may be practicable for the trader to apply a uniform mark up to all the goods he has for sale, but the indications are that such cases are rare. Even where the distributor sells only a few kinds of goods, different margins are commonly obtained in respect of them, and generally it may be taken that goods have to be marked at a price which it is thought they will realise rather than on the basis of any fixed percentage. This, of course, does not apply to the many proprietary goods the prices of which are fixed by the manufacturers, and which have to be sold at certain specified margins\*. In practice, the accounts

\* Proprietary articles probably comprise the bulk of the trade in, e.g., motor cars, motor cycles, cycles, electric lamps, soap, patent medicines, tobacco and confectionery, they also comprise an appreciable part of the trade in, e.g., boots, ironmongery and household requisites, and in grocery a number of articles are sold at prices fixed by the manufacturers. The retailers' margins on proprietary articles vary from trade to trade and from article to article. For example, it is stated that margins of 25 to 33½ per cent. are usually assured to retailers by manufacturers fixing retail prices in the drapery trade, though in the case of sewing cotton the margin is stated to be only 12½ to 15 per cent., and margins of 10 to 15 per cent. in the grocery and tobacco trades are usually assured on proprietary articles. A large proportion of proprietary pharmaceutical articles yield the retailer a margin of 25 per cent. or thereabouts, exclusive in some cases of special rebates for quantities and cash discounts, while toilet goods commonly yield a margin of 33½ per cent. All the foregoing percentages are calculated on retail selling prices, not on the cost to the retailer. Frequently, within a particular trade, the margins tend to be reduced in the case of articles that are largely advertised and for which there is a brisk demand.

of a business or department, showing the total amount of sales, or turnover, in past trading periods and of gross margin, expenses and "net profit" or surplus in respect of them, form the basis of estimates for future trading. The overall gross margin necessary is arrived at by estimating the total sales and the amount of the expenses as a percentage of the sales, and adding to that percentage another representing the surplus aimed at. Thus, if the expenses are assessed at 20 per cent. of total sales and the surplus is to be 5 per cent. the overall gross margin must be 25 per cent. To realise that percentage of gross profit it would be necessary for sales to be effected at an average addition of  $33\frac{1}{3}$  per cent. to cost. Even in a simple business, however, differing rates of mark up would be employed in order to arrive at that result. In the boot and shoe trade, for example, in which retail prices are largely fixed by the manufacturers, and the retailers are stated to obtain, on an average, between 25 per cent. and  $33\frac{1}{3}$  per cent. gross margin on sales, the gross margin on the cheapest boots may be as low as 20 per cent., while on luxury articles or those that may go out of fashion it may be as much as 50 per cent. In businesses such as grocery a uniform mark up on the several kinds of goods cannot be employed. Sugar, for instance, is said to be frequently sold at a very small addition to cost; and tea appears to be sold at a rate of profit varying with quality. One firm of wholesalers in a trade advertisement recommended their 1s. 9d. a lb. tea for a 2s. retail line and their 2s. tea for a 2s. 4d. retail line; in the former case the retailers' margin would be one-eighth and in the latter one-seventh. Proprietary packet teas offered to retailers in another advertisement at 1s. 10d. a lb. were to be sold at 2s. a lb., the retailers' margin being only one-twelfth, while in the case of higher priced teas offered to retailers at 2s. 6d. a lb. the selling price was to be 3s., the retailers' margin being one-sixth. In fashion trades, moreover, which are largely seasonal, the retailers' margin at the opening of the season is often much above the average, while at the end of the season the goods have to be sold at prices which yield less than the average margin and sometimes even represent a loss. The mark up percentages employed in a distributive business will be seen, therefore, to vary for different articles at the same time and even for similar articles at different times. They represent, however, the means adopted for securing the rate of gross margin required for the business as a whole, and it is the gross margin actually realised that represents the cost of distribution from the point of view of the consuming public in general.

#### Retail Distribution.

Within a particular retail trade the rate of gross margin realisable depends upon a variety of considerations. There is, for example, diversity in buying arrangements. The small retailer may obtain practically the whole of his requirements from wholesale houses,

while larger distributive businesses buy much of their goods direct from the manufacturer. The larger undertakings, sometimes individually and at other times in association, are able in some lines of business to employ this method of purchase on a large scale, and are believed to buy as cheaply as the wholesalers. Again, some of them are able to provide for part of their stock by establishing buying agencies which perform for them all the functions of the wholesaler; and these buying agencies have in some cases themselves embarked on production as in the Co-operative movement, whose Wholesale Societies supply roughly one-half of the total requirements of the retail societies, and produce about one-third of what they thus supply. These methods, combined with the advantage of being able to secure especially favourable terms by buying on the largest possible scale, result in lowering the cost of goods to the retail traders concerned, and tend to enable them to realise a larger gross margin, since it must be presumed that their selling prices approximate broadly to those of their competitors.

Again, the gross margin realisable will depend on the class of trade done. The indications are that higher priced and luxury goods yield a larger gross margin to the retailer than do cheaper goods. Any substantial variation in the proportions of the total trade represented by the cheaper goods and others will be reflected in the gross margin realised.

Moreover, the differences in the extent of the services rendered to the public are also, to some extent, reflected in the gross margin. The trader who gives credit to his customers, for example, must of necessity cover himself against the loss of use of his money as well as against the possibility of bad debts.

#### *Gross margins.*

The information available regarding gross margins actually realised in the retail distribution of goods generally is confined to the results of two London departmental stores and of certain retail co-operative societies tabulated in Appendix II, page 157. The former realised in 1924 and 1925 gross margins of 24.6 and 27.7 per cent. on turnover respectively, the difference between them being, no doubt, occasioned in part by differences in the proportions of the various classes of goods sold. The unweighted average of those figures for the departmental stores was 26.15 per cent. The gross margins of the three co-operative societies in the same year ranged from 18.9 to 22.8 per cent., with an unweighted average of 20.6. It should be borne in mind, however, that those two sets of figures are not comparable one with the other. The trade of the three co-operative societies was to the extent of between 75 and 80 per cent. in food.

Moreover, a large proportion of the food sold (viz., from 50 to 65 per cent. of total sales) was accounted for by groceries and provisions, in which there is, as will be seen later, a comparatively low rate of gross margin. Not only is a smaller proportion of the trade of the departmental stores in food, but to a great extent they are engaged in branches of trade which lie outside the scope of the co-operative societies' activities. It is to be expected, too, that in departments dealing in similar commodities the departmental stores sell a larger proportion of higher priced goods, on which the margins tend to be high, than do the co-operative societies.

Both the co-operative societies and the departmental stores must be presumed to enjoy the advantages of large scale buying. Assuming therefore that they sell their commodities at prices which broadly approximate to those of the retail trade generally for similar articles, it is probable that their percentages of gross margin are slightly greater than those of traders who are not able to undertake large scale buying. The comparison made below between the gross margins realised by the three co-operative societies and six proprietary businesses in groceries and provisions shows that on an average those of the co-operative societies exceeded those of the proprietary businesses by 1.7 per cent. on turnover. If a similar difference obtains in other commodities it would appear that the average gross margin realisable in the sale of goods such as are sold by the co-operative societies is round about 20 per cent. on sales, while if the larger margins obtainable in higher priced goods as evidenced by the figures of the departmental stores are taken into account, it seems probable that gross margins on the retail distribution of all commodities are appreciably higher.

In regard to grocery and provisions Table 6, on page 158, includes the figures of six proprietary businesses, whose annual turnover ranged in the year to 31st March, 1925, from £5,300 to £82,200, as well as those of the three co-operative societies already referred to. The gross margins of the six proprietary businesses ranged from 13.5 per cent. on sales to 16.1 per cent., the unweighted average being 15.4. It is not clear, however, how far these businesses may be regarded as representative of proprietary grocery businesses generally. In sea coast towns, where the trade is to some extent seasonal, it is stated that a gross margin of from 18 to 20 per cent. is necessary for this class of business. The co-operative societies' gross margin on grocery and provisions ranged in 1925 from 15.9 per cent., to 18.4 per cent., the unweighted average being 17.1. In one case, however, the figures cover the trade in bread and confectionery, which represented roughly one-sixth of the trade to which the figures relate

The average gross margins realised on sales in the principal departments of the three co-operative societies were :—

*Percentages on sales, 1925.*

						Mean.
All distributive departments	..	..	..	..	..	20·6
Grocery and provisions	..	..	..	..	..	17·1
Boots and shoes	..	..	..	..	..	24·7
Clothing and/or outfitting	..	..	..	..	..	26·5
Drapery	..	..	..	..	..	25·5

It will be seen that the gross margin on grocery and provisions is markedly less than on the trade as a whole.

The gross margins of retail distribution generally, expressed as percentages of sales, appear to have been greater in 1925 than in 1913. In the case of the three co-operative societies the percentages of gross margin in all departments had increased, on an average, from 19·6 per cent. to 20·6 per cent. In grocery and provisions, however, the percentage of gross margin had declined, on an average, from 18·6 per cent. to 17·1 per cent., the increased return on the trade as a whole being accounted for in part by increase of more remunerative trade and in part by increased percentages of gross margin in other departments. The figures of the London departmental stores, which are less affected by grocery, show a larger average increase, viz., from 20·3 per cent. to 26·1 per cent.

*Expenses.\**

The expenses of retail distributors are largely determined by the extent of service given to the public and by the nature and situation of the premises occupied. Their importance when expressed as a percentage on total sales also depends largely on the degree of success of the business in securing the volume of trade for which it is equipped. The expenses of the three co-operative societies in 1925 ranged from 10·4 to 16·5 per cent. of their total sales. The averages of their expenses in their total trade and in their grocery departments in 1925 were 13·4 and 11 per cent. respectively.

In departments other than grocery the expenses of the co-operative societies varied over a wide range. On an average, however, they were very much heavier than in grocery. It may be that the differences between the expenses of the societies are accentuated by such circumstances as the opening of new shops which have not yet secured the requisite volume of trade, or by the departments of one society enjoying a brisker trade than those of another.

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\* Expenses comprise outlay other than in the purchase of the goods to be offered for sale. Cf. the Tables on page 153 and the note prefixed thereto.

The expenses of the six proprietary grocery businesses ranged in the year ended 31st March, 1925, from 7.3 to 14.4 per cent. on turnover. These figures are in most cases low on account of the remuneration of the proprietor having been excluded even where it is probable that he actually works in the business, and they exhibit pronounced variations in the cost of premises. The mean of them, however (10.5 per cent.), corresponds fairly closely with the mean (11 per cent.) of the expenses of the three co-operative societies, which suggests that expenses in grocery business generally are on an average more than 10 per cent. on turnover.

The expenses of the two departmental stores in 1924 and 1925 amounted on an average to 20.15 per cent. on sales, being a little lower than a percentage stated in evidence to represent the average expenses of a number of departmental stores.

The importance of wages and salaries as an element in the expenses of retail distribution generally appears to vary within fairly narrow limits. Wages, salaries and State insurance in 1925 accounted for, in the case of two co-operative societies regarding which particulars are available, 61.6 per cent. of total expenses in one society and 60.9 per cent. in the other. The corresponding figures for the two departmental stores were 60.6 per cent. and 61 per cent., while on an average the wages and State insurance of the six proprietary grocery businesses, excluding in most cases the remuneration of the proprietor, accounted for 54.3 per cent. and those of the grocery department of one co-operative society 61.6 per cent. of the expenses. As regards departmental stores generally, it has been stated that the total pay roll is usually between 10 and 11 per cent. of the total trade and about 50 per cent. of the total expenses. Expressed as percentages of the total trade the wages, salaries and State insurance were 8 and 10 respectively in the case of the co-operative societies, an average of 10½ in that of the six grocery businesses, and 12 and 12½ in the case of the departmental stores. While there may be certain variations in the level of wages, and in efficiency of organisation, it must be remembered that the amount of sales per employee is normally greater in some commodities than in others, and that there are differences in the degree of service rendered to customers by way of, e.g. delivery.

All expenses, other than wages, salaries and State insurance, amounted on an average to 5.8 per cent. of the sales of the two co-operative societies, while in the two departmental stores they amounted on an average to 7.9 per cent. of sales.

The cost of shops and other premises, including rates and property tax, depreciation, repairs and maintenance, and rent where incurred, but excluding interest on capital, accounted for 3.2 per cent. of the total sales of one co-operative society, or 19.4 per cent. of the total

expenses, while it accounted for 1.9 per cent. of sales, or 9.4 per cent. of expenses of one departmental store and for 3.5 per cent. of sales, or 17.7 per cent. of expenses in the case of the other.

Advertising, price lists, postages, etc., and delivery together amounted to 2.9 per cent. of the sales, or 17.4 per cent. of the expenses, of the co-operative society, to 5.6 per cent. of the sales, or 27 per cent. of the expenses, of one departmental store and 4.2 per cent. of the sales, or 21.3 per cent. of the expenses of the other store. Both of the departmental stores deliver goods daily within a wide radius of London. Separate figures for their advertising are not available, but the advertising of such stores was stated by different witnesses to amount to 2.5 and 2.9 per cent. on turnover, and the figures of the two departmental stores do not suggest that the advertising cost included in them attained any larger proportions than 2.5 to 3 per cent. on sales.

The expenses of retail distribution in 1925 appear generally to have been from 2.5 to 4 per cent. of sales greater than in 1913. In the three co-operative societies the increase was on an average 3.5 per cent. on total sales, namely, from 9.9 to 13.4 per cent. In one of the departmental stores it was 3.7 per cent. of sales, while in the other it was as much as 6.4 per cent.

The amount of expenses per £ of sales in 1925 was on an average probably 35 per cent. greater than in 1913. In the case of the three co-operative societies it had increased by 36 per cent. In that of the two departmental stores it had increased by 33 per cent.

	Total Expenses per £ of sales		Wages, Salaries, etc., per £ of sales.	
	1913.	1925.	1913.	1925.
1. Mean of 2 Co-operative Societies.	100	136	100	144
2. Mean of 2 Departmental Stores.	100	133	100	140
3. Mean of 1 and 2. . .	100	135	100	142
4. All Retail Co-operative Societies of Great Britain.	Not stated.		100	131

The mean figures shown in line 3 give an increase per £ of sales of 42 per cent. for wages, salaries and State insurance as compared with 35 per cent. for all expenses. These figures would appear to indicate that on an average the relative importance of wages and salaries had slightly increased in 1925 as compared with 1913, but it is doubtful how far this conclusion is generally applicable, having

regard to the fact that the average percentage increase in wages, salaries, etc., for the two co-operative societies included, viz. 44 per cent., is much higher than the 1925 average for all retail co-operative societies in Great Britain, which was 31 per cent.

The increase in expenses appears in all cases to have been substantially contributed to by the extension of delivery services. The London departmental stores have increased the frequency and extended the area of their deliveries, and representatives of co-operative societies have stated to the Committee that the tendency is more and more for their customers to be canvassed for orders and for goods to be delivered to customers' homes. One of their witnesses stated that, whereas not more than 25 per cent. of the grocery trade of his society was delivered before the war, at least 65 to 75 per cent. was delivered in 1925.

#### *Net margins.*

The surplus of gross margin over expenses expressed as a percentage of sales constitutes what is ordinarily known as the "net profit." Its amount per £ of sales depends, therefore, partly on the relative economy of administration and partly on the volume of business, since if trade is bad the expenses have to be spread over a smaller turnover, as well as on buying arrangements which, as has been seen above, may have an appreciable effect on the amount of gross margin obtainable. The three co-operative societies\* realised an average margin over expenses in 1925 of 7.2 per cent. on sales, being 2.5 per cent. less than in 1913, while the net margins of the two departmental stores were 4 per cent. and 8 per cent., having increased by 1 per cent. and .6 per cent. of sales respectively. Those of the co-operative societies in grocery and provisions were on an average 6.1 per cent., i.e., 3.7 per cent. of sales less than in 1913. The mean net profit of the proprietary grocery businesses, including, in every case but one, the remuneration of the proprietors' services, in the year 1924-25 was 4.9 per cent. of sales.

#### *Net Margins expressed as percentages of Sales.*

		1913.	1925.
3. Co-operative Societies :—			
All Departments (Mean)	.. .. ..	9.7	7.2
Grocery Departments (Mean)	.. .. ..	9.8	6.1
All Departments other than Grocery (Mean)	.. .. ..	9.7	8.4
6. Proprietary Grocery Businesses (Mean)	.. .. ..	—	4.9
2. Departmental Stores (Mean)	.. .. ..	5.2	6.0

\* In the case of co-operative societies the net margin represents the sum available for interest on capital and for repayment to members by way of dividends on purchases.

### Wholesale Distribution.

As will be seen from Tables 1 to 4 of Appendix II, page 153, the fullest information obtained by the Committee in regard to wholesale distribution relates to the trading of two Co-operative Wholesale Societies. These, however, partake of the nature of central buying agencies maintained by associated retail businesses, and in certain important respects their trade and expenses differ largely from those of ordinary wholesale distributors. In the first place the Co-operative Wholesale Societies are able to transact a large part of their business without the goods entering their warehouses. This trade is ordered to be sent direct to the retail societies, and the Wholesale Societies' share in the transaction is limited to the discount, which is understood to range from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  per cent. For that reason the Wholesale Societies may in some districts need less warehouse accommodation in relation to the volume of their trade than do wholesalers generally, while labour charges for handling of goods are also diminished. Again, they have, subject doubtless to efficiency and to their being able to sell at or below competitive prices, a fairly well assured market, and the cost they incur in travelling and advertising appears to be lower in comparison. They have too another advantage as compared with wholesale traders generally in that, whereas wholesalers appear in many cases to supply retailers with goods on long credit, and in fact, therefore, finance the retail trader, the Co-operative Wholesale Societies are not in the same proportion called upon to shoulder this burden and, therefore, have not the same need to provide for it in their gross margins. The differences that may be looked for, in consequence of these factors, between the expenses and gross margins of wholesale traders and those of the Co-operative Wholesale Societies are exemplified by the figures relating to drapery and clothing set out in Table 2 of Appendix II (page 154) from which it will be seen that the expenses per £ of sales of a wholesale textile house in 1924 were roughly double those of the Co-operative Wholesale Societies in 1924 and 1924-25 and its gross margin on sales approximately one and a half times as heavy.

#### *Gross margins.*

The figures of the Co-operative Wholesale Societies show an average gross margin on total sales of 4 per cent. As in the case of the retail societies, lower gross margins were realised on the grocery and provisions trade, the average in that trade being 2.8 per cent. while those in other departments were much higher. In drapery they averaged 9.1 per cent., in boots and shoes 7.8 per cent., while the woollens and ready-mades department of one Wholesale Society showed a gross margin of 10.3 per cent. These figures relate to the post-war year.

On their total trade the gross margins of the Wholesale Societies had on an average declined as compared with pre-war from 5.1 to 4

per cent. of sales. The decline in the grocery and provisions departments was from 3.9 to 2.8 per cent. One Wholesale Society had maintained its pre-war rate of gross margin in its drapery and boot and shoe department, and had slightly increased that in its woollens and ready-mades department from 10 to 10.3 per cent., while the gross margins of the other had declined in drapery from 10.7 to 8.8 per cent. and increased in boots and shoes from 7.9 to 9.8 per cent. The gross margin of the wholesale textile house was 13.6 per cent. in 1913 and 14 per cent. in 1924. The indication furnished by these figures is that as in retail distribution there has been a reduction of gross margins, in the Co-operative Wholesale Societies' trade at least, in grocery and provisions, while in textiles, clothing, boots and shoes the pre-war rates have been generally maintained or slightly increased.

#### *Expenses.*

The expenses of the Co-operative Wholesale Societies amounted in the post-war years considered to 1.9 per cent. and 3 per cent. respectively of their total sales. In grocery and provisions they accounted for 1 per cent. and 2 per cent. respectively, in boots and shoes for 4.2 and 5.9 per cent., in drapery for 6.9 and 6.2 per cent., while in the woollens and ready-mades department of one Wholesale Society they amounted to 7.2.

As compared with pre-war, expenses per £ of sales showed little change in the total trade or in the grocery and provisions department of one Wholesale Society, while they had increased from 2.2 to 3 per cent. of sales in the total trade of the other Wholesale Society and from 1.3 to 2 per cent. of sales in its grocery department. The expenses of the wholesale textile house increased from 11.9 per cent. in 1913 to 12.6 per cent. in 1924.

The relative importance of wages and salaries on the one hand, and of other expenses on the other, does not appear to have suffered any large change as compared with the pre-war period. In the case of the textile house wages, salaries, directors' fees and National insurance accounted for, roughly, 51 per cent. of the total expenses in 1913 and for some 51½ per cent. in 1924. Wages, salaries and National insurance amounted to 57 per cent. of the total expenses of one Co-operative Wholesale Society in 1913-14, and for 62 per cent. in 1924-25. In the case of the other Wholesale Society wages and salaries amounted to 58 per cent. of the total expenses in 1913 and 60 per cent. in 1924.

#### *Net margins.*

In the years 1924-25 and 1924 respectively, the two Co-operative Wholesale Societies realised an average surplus of gross margin over expenses of 1.5 per cent. In grocery and provisions the surplus was 1.3 per cent., in boots and shoes 2.7 per cent., in drapery 2.6 per

cent., and in the woollens and ready-mades department of one society 3·1 per cent. It will be observed that the surplus realised in grocery and provisions was appreciably lower than that realised in other departments. Compared with the pre-war years the surpluses of the Co-operative Wholesale Societies had in each case fallen, viz., from 2·3 to 1·4 per cent. of sales in one case, and from 4·0 to 1·7 per cent. in the other. The surplus of the wholesale textile house in 1924 was 1·4 per cent. of sales as compared with 1·7 per cent. in 1913.

### COSTS OF TRANSPORT.

The investigation of costs has not been directed specially to the costs of transport undertakings and services. Certain data are, however, available regarding the proportion of Wages and Other Expenses in such costs.

#### *Railway Transport.*

The following figures were submitted to the Committee on behalf of the four group railway companies formed under the Railways Act of 1921, and are understood to cover the receipts and expenditure in respect of the railway and ancillary undertakings of the companies. The available information does not enable the figures to be analysed as between railway working and other activities. Since, however, railway working as distinct from ancillary activities accounted in 1924 for £196,287,000 out of the total receipts of £214,714,000, and for £162,197,000 out of the total expenditure of £178,162,000, the figures serve to indicate approximately the importance of wages and other expenses as elements in the cost of railway transport.

	1913. £	Per cent.	1924. £	Per cent.
Wages .. ..	47,386,000	37·0	119,800,000	56
Other expenses ..	34,575,000	27·8	58,362,000	27
Total working expenses	81,961,000	64·8	178,162,000	83
Net receipts .. ..	44,619,000	35·2	36,552,000	17
Total receipts ..	126,580,000	100·0	214,714,000	100

Included in the expenses other than wages are £19,237,923 in 1924 for materials in the civil and mechanical engineering departments, approximately £8,500,000 in 1913, and £16,000,000 in 1924 for locomotive coal, and upwards of £4,500,000 in 1913, and £7,000,000 in 1924 for local rates.

The average increase in wages rates for railway wages grades, except shopmen, between 1913 and 1924 is stated to have been 125 per cent.

The total number of staff in 1913 was 591,000, and in 1924 667,000, an increase of 76,000, or 13 per cent. The greater part—a proportion difficult to identify precisely—of that increase in numbers was stated to have been due to the operation of the eight hours day introduced in 1919.

The Railways Act, 1921, provided that the Railway Rates Tribunal should fix such charges as would yield an annual net revenue equivalent to the aggregate net revenues in the year 1913, plus allowances on additional and unfructified capital. This net standard revenue has been fixed by the Tribunal at £50,063,837, which, however, only includes the allowances on additional capital expenditure up to April, 1927.

The rates and charges fixed by the Tribunal came into operation on 1st January, 1928. In the few preceding years the aggregate net receipts of the four Companies fell short of the standard revenue by substantial amounts. Thus, in 1924 the deficiency was approximately £7,000,000, or about 6 per cent. of the wages bill. In 1925 the deficiency was about £10,000,000.

#### *Road Transport.*

The relative importance of wages in the cost of road transport varies with the type and size of vehicle<sup>†</sup> employed, the effective use made of the vehicle and the method of charging depreciation on it. The following percentages of expenses are averages compiled from certain published returns relating to motor vehicles which may be presumed to have been fully employed.

#### *Motor Vans of:—*

	1 ton.	2 ton.	4 ton.	5 ton.	6 ton.
Wages .. .. .. ..	44.9	42.1	24.6	24.4	20.6
Petrol .. .. .. ..	11.6	13.2	15.4	22.6	21.9
Depreciation and Insurance ..	26.3	26.2	25.7	53.0 *	57.5 *
Other Expenses .. ..	17.2	18.5	34.3		
Total cost .. ..	100.0	100.0	100.0	100.0	100.0

<sup>†</sup> Including interest on Capital

It would appear from these figures that wages account for, roughly, 25 per cent. of the cost of running heavy lorries, and 40 to 45 per

<sup>†</sup> Certain returns available in relation to the working of steam road vehicles show on an average the following proportions of costs.—Wages, 45 per cent.; fuel, 10 per cent.; depreciation and insurance, 21 per cent.; and other expenses, 24 per cent.

cent of the cost of running light vans, but in each case the percentage would be higher if the vans were not fully employed. It is possible that in some of the cases examined the wages of staff other than drivers is included in Other Expenses.

*Ocean Transport.*

It was stated in evidence in July, 1925, that the total wages cost, including not only the wages of the crew but the wages of loading and discharging, comprised 37.5 per cent of the total voyage expenses of a particular tramp steamer, while in other cases it amounted to from 30 to 48 per cent., the outlay on coal being some 25 per cent. of the total expenses.

## APPENDIX I.

## TABLES OF COSTS OF PRODUCTION.

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## EXPLANATORY NOTE.

The tables on page 127, *et seq.*, embody the information in regard to costs of production furnished to the Committee by various firms and associations. They are designed to show:—

(1) the relative importance in 1913 and 1924\* respectively of the constituent heads of cost expressed as percentages of the total cost of given units of production (columns 1 and 2),

(2) the percentage increase in the total cost in the post-war as compared with the pre-war year, and the amounts which each of the constituent heads of cost contributed to the increase (column 3),

(3) the percentage increase between the two years in question in each of the constituent heads of cost considered separately (column 4).

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\* In some cases the figures relate to the years 1914 and 1925, or 1923 as shown in the tables

The plan on which the tables have been compiled and the manner in which they are to be read are illustrated by the following figures relating to Coal Mining, showing particulars given in Table 1, and the information, viz. costs per ton in pence, on which they are based.

Heads of Cost	Col. 1.		Col. 2		Col. 3	Col. 4
	Cost per ton in pence, 1913	Dis-tribution of Cost, 1913	Cost per ton in pence, 1925	Dis-tribution of Cost, 1925	Cost in 1925 in terms of total 1913 cost taken as 100	Items of 1925 cost in terms of relative 1913 figures taken as 100
Materials. ..	Pence 13 00	Per cent 11.4	Pence 22.26	Per cent 10.3	19.6	171
Wages and Salaries	85.45	75.3	160.74	74.3	141.6	188
Other Expenses	15.05	13.3	33.22	15.4	29.3	221
Totals	113.50	100.0	216.22	100.0	190.5	—

The percentage figures of Col. 1 are those of the 1913 cost per ton in pence expressed in percentage form and those of Col. 2 are those of the 1925 cost per ton in pence similarly expressed. In Col. 3 the 1925 figures of cost in pence are expressed as percentages not of the total 1925 cost (216.22d.), but of the total 1913 cost (113.50d.). This column shows, therefore, that the total cost per ton of coal raised had increased in 1925 to 190.5 per cent of the 1913 cost, of which Materials accounted for 19.6 per cent., Wages and Salaries for 141.6 per cent., and Other Expenses for 29.3 per cent. The figures of Col. 4 show each head of 1925 cost separately expressed as a percentage of its own 1913 level. Thus, Materials in 1925 at 22.26d were equivalent to 171 per cent of the 1913 Material cost, viz 13d.

It will be seen, therefore, in the light of the foregoing explanations, that if a quantity of coal cost £100 to raise in 1913 (Col. 1), Materials accounted for £11.4 of the £100, Wages and Salaries for £75.3, and Other Expenses for £13.3. The same quantity of coal cost £190.5 (Col. 3) to raise in 1925, of which Materials accounted for £19.6, Wages and Salaries for £141.6, and Other Expenses for £29.3. The rate of growth in each of these heads of cost is shown in Col. 4. Thus, Materials at £19.6 were 171 per cent. of the 1913 Materials (£11.4), Wages and Salaries at £141.6 were 188 per cent. of the 1913 Wages and Salaries (£75.3), and Other Expenses at £29.3 were 221 per cent. of the 1913 Other Expenses (£13.3).

The extent to which, by reason of their differing rates of increase, the several heads of cost had altered in their relative importance as parts of the total cost of production will be seen in Col. 2, where each head is shown as a percentage of the total post-war cost. Thus, the Material cost in Coal Mining, which in 1913 comprised 11.4 per cent. of the total cost, comprised in 1925 10.3 per cent., i.e. £19.6 out of £190.5, and Wages and Salaries, which in 1913 accounted for 75.3 per cent. of the total cost, comprised in 1925 74.3 per cent., i.e. £141.6 out of £190.5.

It should be noted that the figures in Col. 4 of the tables have been calculated not from the figures given in the other columns, which are approximated to one place of decimals, but from the original information furnished, which was in some cases to two or more places of decimals and in others in terms of money.

In view of the importance from a cost point of view of the extent to which the undertakings concerned were employed information has been given, where available, at the head of the tables as to the ratio of actual to potential production in both the pre-war and the post-war year. In those cases where such information is not available information is given, wherever possible, of the relative size of the total output in the two years. This information, however, is a less reliable guide to the extent to which the works were employed than are the figures of ratio of actual to potential production, except in cases where the capacity of the undertakings has remained unchanged.

Every care has been taken in collecting the data presented in the tables to obtain figures relating in each case to as nearly as possible an identical unit of production in both the pre-war and the post-war year. Wherever factors that would disturb comparison are known to exist the fact has been indicated by footnotes to the tables, except where, as in the case of tables having reference to the output of an entire factory or industry, the title of the table is itself sufficient warning that the unit of production may not be precisely similar in each year.

#### *Classification.*

The degree of detail furnished in the returns made by manufacturers and the methods of costing employed differ, and it has, therefore, not been possible to secure complete uniformity of classification in the tables. The majority of the returns made were rendered on the Schedule employed by the Committee in collecting the data. A copy of that Schedule will be found at page 150. Other figures submitted are based on returns made to trade organisations, and these exhibit certain differences of form.

So far as possible the figures of cost have been grouped under the main heads (a) Materials, (b) Wages and Salaries, and (c) Other Expenses. The figures classed under Wages and Salaries comprise the total wages and salaries paid except in so far as such payments are included in Other Expenses, e.g. under the heading of Maintenance and Depreciation of Plant and Buildings or under the heading of Other Charges.

Where detailed information is available the particulars have been tabulated according to the following classification, and modifications of that classification, where they are known to exist, are indicated by footnotes.

*Materials* comprises the cost of direct materials of manufacture and of process materials. Usually freight on materials is included. In some cases Materials are shown "less credits."

*Wages, direct*, comprises the cost of wages described as "Direct" or "Productive," and are assumed to represent all payments for labour that can be booked direct to a process or order.

*Wages, indirect*, comprises the cost of wages described as "Indirect" or "Unproductive." The item of works expenses "Unproductive Wages and Salaries," where furnished, is here included.

*Wages, total*, represents the total of direct and indirect wages where separate figures are available, or "Wages" or "Labour" where only total figures were given.

*Salaries* comprises the items of cost "Salaries," "Administrative and Office Staff," and "Directors' and Partners' Salaries," whichever were given.

*Power, etc.* comprises the items of cost "Fuel and Motive Power" and "Lighting, Heating and Water."

*Depreciation and Maintenance* comprises the cost of "Depreciation of Plant and Buildings," and "Repairs and Maintenance of Plant and Buildings." In cases where repair and maintenance work is carried out by the manufacturers' own staff the remuneration of such staff is presumed to be here included.

*Rates, Property Tax and Social Charges* comprises the items of cost "Local Rates," "Property Tax," "State Insurance," and "Workmen's Compensation."

*Other Charges* comprises all items of cost not covered by the foregoing, and includes items appropriate to other heads where the degree of detail furnished does not permit of an exact allocation to the separate heads.

Interest on capital, taxes other than property tax, and outward freight on the products of manufacture have been excluded except where otherwise stated.

TABLE 1.  
COAL MINING \*

Heads of Cost.	Distribution of Cost.		Cost in 1925 in terms of total 1913 cost taken as 100.	Items of 1925 cost in terms of relative 1913 figures taken as 100.
	1913.	May-July, 1925.		
Materials† ..	11.4	10.3	19.6	171
Wages and Salaries ..	75.3	74.3	141.6	188
Wages—Direct ..	—	—	—	—
Indirect ..	—	—	—	—
Total ..	72.7	70.7	134.7	185
Salaries—Office, Management, etc	2.6	3.6	6.9	266
Other Expenses ..	13.3	15.4	29.3	221
Power, Light, Water, Heating, etc	†	†	†	—
Depreciation and Maintenance	†	†	†	—
Rates, Property Tax and Social Charges§ ..	3.6	5.9	11.2	315
Other Charges   ..	9.7	9.5	18.1	186
Totals ..	100.0	100.0	190.5	—

\* The particulars shown are based on the table—Comparison of Costs of Production per Ton Commercially Disposable in the Coal Mining Industry of Great Britain (excluding South Staffs and Salop, Cumberland and Bristol) in 1913 and May-July, 1925—published in the Report (Vol. 3, page 45) of the Royal Commission on the Coal Industry, 1925.

† Included in Other Charges except, in the case of Maintenance, in so far as Timber and Stores are included in Materials, and the wages of maintenance are included in Wages.

‡ Relates to the item of cost "Timber and Stores" only.

§ Including the item of cost "Welfare."

|| Including Royalties which amounted to 5.35d per ton in 1913 and 6.33d. per ton in May-July, 1925, or 4.71 and 2.93 per cent. respectively of the total cost.

TABLE 2  
COKE MAKING.

Heads of Cost	Plant A			Plant B.			Plant C.		
	1924-25 output 94 per cent. of that in 1913-14.			1924-25 output 81 per cent. of that in 1913-14.			1924-25 output 51 per cent. of that in 1913-14.		
	Distribution of Cost.		Items of 1924-25 cost in terms of total 1913-14 cost taken as 100.	Distribution of Cost.		Items of 1924-25 cost in terms of total 1913-14 cost taken as 100.	Distribution of Cost.		Items of 1924-25 cost in terms of total 1913-14 cost taken as 100.
	1913-14	1924-25.		1913-14	1924-25.		1913-14	1924-25	
Materials*	84.9	85.2	142.6	168	78.7	81.2	168.7	214	80.9
Wages and Salaries	—	—	—	—	—	—	—	—	—
Wages—Direct	..	..	..	..	..	..	..	..	..
Indirect	..	..	..	..	..	..	..	..	..
Total	10.3	—	8.3	13.9	11.7	9.7	20.1	172	10.7
Salaries—Office, Management, etc.	‡	‡	‡	—	‡	‡	‡	‡	‡
Other Expenses	4.8	6.5	10.9	224	9.6	9.1	18.7	195	6.9
Power, Light, Water, Heating, etc.†	1.5	1.7	2.8	180	0.7	0.7	1.5	209	1.1
Depreciation, and Maintenance	1.6	2.1	3.5	215	6.1	5.7	11.8	193	3.6
Rates, Property Tax and Social Charges§	0.6	1.2	2.0	323	1.1	1.0	2.0	176	0.7
Other Charges	1.1	1.5	2.6	246	1.7	1.7	3.4	206	1.5
Totals	—	100.0	167.4	—	100.0	100.0	207.5	—	100.0
									224.2
									—

\* Gross cost of coals to ovens, 1 c excluding credits for the value of residuals.

† Includes Water.

‡ Electric power only.

|| Depreciation is excluded.

TABLE 3

## GAS.

*Ratio of actual to potential production :  
1913, 80 per cent., 1924, 97 per cent.*

Heads of Cost.	Distribution of Cost.		Cost in 1924 in terms of total 1913 cost taken as 100.	Items of 1924 cost in terms of relative 1913 figures taken as 100.
	1913	1924.		
Materials* .. ..	Per cent 10·2	Per cent. 12·9	23·4	229
Wages and Salaries ..	45·7	46·1	84·0	184
Wages—Direct .. ..	40·2	38·9	70·8	176
Indirect .. ..	3·8	5·4	9·9	261
Total .. ..	44·0	44·3	80·7	183
Salaries—Office, Management, etc.	1·7	1·8	3·3	194
Other Expenses .. ..	44·1	41·0	74·7	169
Power, Light, Water, Heating, etc.	23·2	23·7	43·1	186
Depreciation and Maintenance				
Rates, Property Tax and Social Charges	12·9	8·5	15·5	120
Other Charges .. ..	8·0	8·8	16·1	201
Totals .. ..	100·0	100·0	182·1	—

*Note*—The above figures were supplied by the National Gas Council and are stated to refer to the total production of one large undertaking.

\* Net value of materials after crediting value of residuals.

TABLE 4

## BASIC PIG IRON.

*Ratio of actual to potential production  
1913, 84 per cent; 1924, 58 per cent.*

Heads of Cost.	Distribution of Cost, 1913	Cost in 1924 in terms of total 1913 cost taken as 100	Items of 1924 cost in terms of relative 1913 figures taken as 100
Materials* .. .. .	Per cent 82.5	127.3	154
Wages and Salaries   .. .. .	8.9	17.4	195
Wages—Direct .. .. .	—	—	—
Indirect .. .. .	—	—	—
Total .. .. .	—	—	—
Salaries—Office, Management, etc.	—	—	—
Other Expenses .. .. .	8.6	13.4	156
Power .. .. .	2.9	3.7	126
Repairs and Maintenance† ..	3.8	6.1	160
Rates, Property Tax and Social Charges	0.6	1.2	197
Other Charges .. .. .	1.3	2.4	194
 Totals .. .. .	100.0	158.1	—

*Note.*—This table is based on information supplied by the National Federation of Iron and Steel Manufacturers relating to the production of nine Companies, representative of the N.E. Coast, Wales, Scotland and Lincolnshire districts, which in 1924 amounted to approximately 1,500,000 tons, or 61 per cent of the total output of *basic* pig iron, or some 20 per cent of the total production of pig iron in Great Britain. Depreciation was not taken into account in arriving at the total costs.

\* Materials less credits

† It was stated that it was not possible to make an accurate division between Wages and Salaries because of the fact that in many cases Wage Earners in 1913 were classified as Salaried Staff in 1924.

‡ Depreciation is excluded

## COSTS OF PRODUCTION.

TABLE 5.  
BASIC STEEL.—MANUFACTURE OF STEEL, INGOTS, SEMI-FINISHED STEEL, SECTIONS AND PLATES  
FROM RAW MATERIALS.

Ratio of actual to potential production	Steel Ingots			Semi-finished Steel			Sections			Plates (4" and over)		
	1913, 94 per cent, 1924, 76 per cent			1913, 93 per cent, 1924, 69 per cent			1913, 100 per cent, 1924, 78 per cent			1913, 100 per cent, 1924, 62 per cent		
	Distri- bution of Cost, 1913	Cost in 1924 in terms of total 1913 cost taken as 100	Items of 1924 cost in terms of relative 1913 figures taken as 100	Distri- bution of Cost, 1913	Cost in 1924 in terms of total 1913 cost taken as 100	Items of 1924 cost in terms of relative 1913 figures taken as 100	Distri- bution of Cost, 1913	Cost in 1924 in terms of total 1913 cost taken as 100	Items of 1924 cost in terms of relative 1913 figures taken as 100	Cost in 1924 in terms of total 1913 cost taken as 100	Distri- bution of Cost, 1913	Cost in 1924 in terms of total 1913 cost taken as 100
Heads of Cost												
Materials*	73.5	115.4	157	70.8	114.7	162	63.6	101.4	159	62.9	104.3	166
Wages and Salaries†	14.8	26.6	179	16.3	30.4	187	21.8	38.6	177	23.0	39.6	172
Wages—Direct			—	—	—	—	—	—	—	—	—	—
Indirect			—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—
Salaries—Office, Management, etc	—	—	—	—	—	—	—	—	—	—	—	—
Other Expenses	11.7	19.4	165	12.9	22.8	177	14.6	28.5	196	14.1	27.6	196
Power	2.6	4.0	151	2.9	4.8	167	3.4	7.4	219	2.5	6.1	241
Repairs and Maintenance‡	6.9	10.9	158	7.5	12.6	169	8.3	14.5	174	9.1	15.4	170
Rates, Property Tax and Social Charges	0.7	1.9	25.4	0.9	2.3	24.7	1.0	2.9	282	1.0	2.8	288
Other Charges	1.5	2.6	181	1.6	3.1	194	1.9	3.7	201	1.5	3.3	222
Totals	100.0	161.4	—	100.0	167.9	—	100.0	168.5	—	100.0	171.5	—

Note.—This table is based on information supplied by the National Federation of Iron and Steel Manufacturers and represents in each case the cumulative cost of production from the raw material, i.e. Coal, Coke, Iron Ore, Ironstone and Fluxes used in the Manufacture of Basic Pig Iron as shown in Table 4, so that the Wages and Salaries cost for example, in a ton of plates (23.0 per cent in 1913) represents not only the direct labour cost in the rolling of the plate, but the labour element in the semi-finished product or ingot from which the plate is rolled as well as the labour cost in the manufacture of the pig iron. The figures in each case are the averages of firms representative of the principal districts and are based on roughly 20 per cent of the total British production in 1924 of ingots, 20 per cent of total production in the case of Semi-finished Steel, and 25 per cent of the total production of Sections and Plates. Depreciation was not taken into account in arriving at the total costs.

\* Materials less credits.

† It was stated that it was not possible to make an accurate division between Wages and Salaries because of the fact that in many cases Wage Earners in 1913 were

classified as Salaried Staff in 1924.

‡ Depreciation is excluded.

TABLE 6.  
SUNDRY PIG IRON AND STEEL COSTS.

		FIRM A *		Steel Ingots.		Steel Billets	
		Basic Pig Iron.		1913-14, 78 per cent.; 1924-25, 53 per cent.		1913-14, 80 per cent., 1924-25, 77 per cent.	
Ratio of actual to potential production }		1913-14, 68 per cent., 1924-25, 48 per cent.		Distribution of Cost		Distribution of Cost	
Heads of Cost.		1913-14	1924-25	1913-14	1924-25.	1913-14.	1924-25.
Materials	• ..	84.3	80.9	135.6	161	84.7	79.3
Wages and Salaries	8.6	8.7	14.6	169	7.3	7.6	122.8
Wages—Direct	8.0	7.8	13.1	164	6.2	6.4	145
Indirect	0.2	0.3	0.5	228	0.7	0.9	92.6
Total	8.2	8.1	13.6	166	6.9	7.1	162
Salaries—Office, Management, etc	0.4	0.6	1.0	237	0.4	0.5	3.5
Other Expenses	7.1	10.4	17.5	247	8.0	13.1	11.7
Power, Light, Water, Heating, etc.	0.1	0.2	0.3	414	0.1	0.2	160
Depreciation and Maintenance	3.8	5.5	9.2	238	5.8	7.6	156
Rates, Property Tax and Social Charges	0.4	0.8	1.3	375	0.8	1.5	304
Other Charges	2.8	3.9	6.7	240	1.3	3.8	6.0
Totals	100.0	100.0	167.7	—	100.0	104.8	157.5
					—	100.0	—
						100.0	—
						157.5	—

\* In the case of Firm A it is definitely stated that two shifts per day were being worked in the pre-war year, also that the works were closed for 8 weeks in the post-war year in consequence of a labour dispute.

TABLE 6—*contd*

Heads of Cost,	FIRM B.—Hematite Pig Iron.*			FIRM C.—Common Billets and Sheet Bars		
	1924 Output 63 per cent of that in 1913		Cost in 1924 in terms of total 1913 cost taken as 100.	Ratio of actual to potential production. 1912, 75 per cent; 1924, not stated		
	Distribution of Cost.	1913.		1924.	1912.	1924.
Materials	Per cent	90.8	Per cent	82.9	Per cent	87.0
Wages and Salaries	..	..	..	—	4.8	5.8
Wages—Direct	..	..	5.0	—	—	—
Indirect	..	..	0.9	2.0	2.7	—
Total	..	..	6.9	10.6	14.2	24.1
Salaries—Office, Management, etc	..	..	††	††	—	0.9
Other Expenses	..	..	3.3	6.5	8.7	25.8
Power, Light, Water, Heating, etc.	..	..	††	††	—	—
Depreciation and Maintenance	..	..	††	††	—	—
Rates, Property Tax and Social Charges	..	..	0.3	0.7	0.9	25.9
Other Charges	..	..	3.0	5.8	7.8	25.8
TOTALS	..	100.0	100.0	134.0	—	100.0
					100.0	183.3
						—

\* The comparison between the two periods is affected by the following facts:—

(a) The production in 1913 was from five small furnaces and one large modern furnace, but in 1924 the large furnace was not used.

(b) In 1913 the whole of the production was used in the firm's own melting shops whereas in 1924 the whole of the production was being sold.

† Depreciation is excluded.

†† Included in Other Charges.

TABLE 7

## TINPLATES

Heads of Cost.	Distribution of Cost		Cost in 1924 in terms of total 1914 cost taken as 100	Items of 1924 cost in terms of relative 1914 figures taken as 100
	1914	1924.		
Materials .. ..	70.3	62.1	104.1	148
Wages and Salaries ..	—	—	—	—
Wages—Direct .. ..	—	—	—	—
Indirect .. ..	—	—	—	—
Total .. ..	18.6	22.5	37.7	203
Salaries—Office, Management, etc	*	*	*	—
Other Expenses .. ..	11.1	15.4	26.0	233
Power, Light, Water, Heating, etc	3.7	4.9	8.2	218
Depreciation and Maintenance	5.7	7.2	12.2	214
Rates, Property Tax and Social Charges†	0.4	1.1	1.8	508
Other Charges .. ..	1.3	2.2	3.8	282
Totals .. ..	100.0	100.0	167.8	—

*Note*—It is stated that the figures given are based on the actual results of a representative works where the plant, capacity, etc., remained since 1914 practically unchanged.

\* Included with Other Charges.

† Including Welfare.

TABLE 8.  
WIRE AND WIRE NETTING \*

Heads of Cost	WIRE			WIRE NETTING *		
	Distribution of Cost		Cost in 1924 in terms of total 1913 cost taken as 100.	Distribution of Cost		Cost in 1925 in terms of total 1913 cost taken as 100
	1913.	1924.		1913	1925	
Materials . . . .	75 5	Per cent 67.9	104.0	138	Per cent 59.0	94.7
Wages and Salaries ..	16 9	21 1	32.3	28 6	57 4	161
Wages—Direct	12.9	16.2	24.9	17.9		
Indirect	0.8	1.0	1.5	+6.2		
Total .. . .	13.7	17.2	26.4	24.1	†7.2	164
Salaries—Office, Management, etc.	3.2	3.9	5.9	186	23.5	150
Other Expenses .. . .	7.6	11 0	16.8	•	4.9	192
Power, Light, Water, Heating, etc	§1 5	§2.4	§3 7	12.4	14 2	161
Depreciation and Maintenance†	3.0	4.0	6.1	246	2.2	164
Rates, Property Tax and Social Charges .	0.9	2.2	3.3	200	5 4	150
Other Charges . . .	2.2	2.4	3.7	381	1 8	192
Totals .. . .	100 0	100 0	153.1	—	100 0	165.0

\* Covering the preparation of the wire rod, the manufacture of the wire itself, and the cost in the netting factory.

† Principally composed of warehouse wages. † Depreciation is excluded. § Fuel and Light only. Power and Light only.

TABLE 9.

## THE ENGINEERING INDUSTRY.

Heads of Cost.	Distribution of Cost.			
	1923.	1924.	1925	1926.
Materials.. ..	Per cent. 44.5	Per cent. 46.1	Per cent. 46.3	Per cent. 46.1
Wages and Salaries ..	35.5	35.4	35.5	35.7
Wages—Direct ..	20.6	20.5	20.9	20.5
Indirect† ..	13.4	13.4	13.1	13.7
Total ..	34.0	33.9	34.0	34.2
Salaries—Office, Management, etc.*	1.5	1.5	1.5	1.5
Other Expenses ..	20.0	18.5	18.2	18.2
Power, Light, Water, Heating, etc	—	—	—	—
Depreciation and Maintenance	—	—	—	—
Rates, Property Tax and Social Charges	—	—	—	—
Other Charges ..	—	—	—	—
 Totals .. ..	100.0	100.0	100.0	100.0

*Note.*—This table is based on information supplied by the Engineering and Allied Employers' National Federation, the number of firms and the turnover represented being—

	Firms	Turnover. £
1923 .. .. .	1,438	188,703,250
1924 .. .. .	1,149	190,499,790
1925 .. .. .	1,071	196,102,230
1926 .. .. ..	1,030	187,764,330

† Includes payments in respect of National Health and Unemployment Insurance, see also note \*

\* Comprises the remuneration of partners, directors and managing directors, the salaries of staff, including management, general office and drawing office, are included in Indirect Wages

TABLE 10.

## AGRICULTURAL MACHINERY.

1923 Output 45 per cent. of that in 1913.

Heads of Cost.	Distribution of Cost		Cost in 1923 in terms of total 1913 cost taken as 100.	Items of 1923 cost in terms of relative 1913 figures taken as 100
	1913.	1923.		
Materials .. .. ..	Per cent. 46.5	Per cent. 37.0	77.7	167
Wages and Salaries ..	—	—	—	—
Wages—Direct ..	26.9	23.9	50.2	187
Indirect ..	9.4	13.8	29.0	307
Total .. ..	36.3	37.7	79.2	218
Salaries—Office, Management, etc	*	*	*	—
Other Expenses .. ..	17.2	25.3	53.2	309
Power, Light, Water, Heating, etc.	—	—	—	—
Depreciation and Maintenance	—	—	—	—
Rates, Property Tax and Social Charges	—	—	—	—
Other Charges .. ..	—	—	—	—
Totals .. ..	100.0	100.0	210.1	—

*Note.*—The comparison of pre-war and post-war figures regarding Agricultural Machinery can only be approximate on account of differing proportions of various types and sizes of machinery manufactured. The figures given are based on data supplied by the Agricultural Engineers' Association, embodying the results of 29 firms, comprising over 90 per cent. of the trade of the membership.

\* Salaries are included with Other Expenses, which also include interest on borrowed money. Remuneration of managing directors or partners is excluded.

## COSTS OF PRODUCTION

TABLE 11.  
LOCOMOTIVE CONSTRUCTION.

Heads of Cost	LOCOMOTIVE CONSTRUCTION *			FIRM A—LOCOMOTIVE AND TENDER		
	Ratio of actual to potential production } 1913, 80 per cent approx 1925, 30 per cent approx } †		Cost in 1925 in terms of total 1913 cost taken as 100	Items of 1925 cost in terms of relative figures taken as 100		Cost in 1925 in terms of total 1913 cost taken as 100
	Distribution of Cost	1913	1925	1913	1925	
Materials	59.0	46.0	73.6	(Approx.)	(Approx.)	46.2
Wages and Salaries	—	—	—	—	—	35.7
Wages—Direct	26.0	27.0	43.2	166	—	26.9
Indirect	6.0	9.0	14.4	240	—	6.1
Total	32.0	36.0	57.6	180	—	33.0
Salaries—Office, Management, etc.	..	..	..	—	—	2.7
Other Expenses	9.0	18.0	28.8	320	—	18.1
Power, Light, Water, Heating, etc	—	—	—	—	—	3.1
Depreciation and Maintenance	—	—	—	—	—	5.7
Rates, Property Tax and Social Charges	—	—	—	—	—	32.9
Other Charges	—	—	—	—	—	6.4
Totals	100.0	100.0	160.0	—	—	100.0
						130.0

\* Based on information supplied by the Locomotive Manufacturers' Association. The comparison of the 1913 and 1925 figures can only be approximate on account of differing proportions of various types and sizes of locomotives manufactured.

† Based on numbers of locomotives produced

‡ Included in Other Expenses

§ Including Rent

TABLE 12.  
MARINE ENGINES AND BOILERS, ETC.

\*Ratio of actual to potential production  
1913,  $\frac{7}{4}$  per cent, 1924,  $\frac{3}{4}$  per cent.

Heads of Cost	Distribution of Cost.		Cost in 1924 in terms of total 1913 cost taken as 100.	Items of 1924 cost in terms of relative 1913 figures taken as 100.
	1913.	1924		
Materials .. .	Per cent.	Per cent.		
Materials .. .	63.0	59.0	100.0	160
Wages and Salaries ..	25.0	28.8	48.9	198
Wages—Direct .. .	—	—	—	—
Indirect .. .	—	—	—	—
Total .. .	23.0	26.0	44.0	195
Salaries—Office, Management, etc.	2.0	2.8	4.9	244
Other Expenses .. .	12.0	12.2	21.1	179
Power, Light, Water, Heating, etc.	1.6	1.0	1.7	106
Depreciation and Maintenance	3.0	3.5	6.2	209
Rates, Property Tax and Social Charges	1.5	1.7	3.0	205
Other Charges .. .	5.9	6.0	10.2	176
Totals .. .	100.0	100.0	170.0	—

\* On a horse-power basis.

TABLE 13.  
SUNDRY ENGINEERING COSTS.

Heads of Cost.	FIRM A—CONDENSER PLANT		FIRM B—BALING PRESS.		FIRM C—HEAVY OIL ENGINES AND PARTS THEREOF;†	
	Distribution of Cost		Total output of the whole works in 1924, 78 per cent. of that of 1913.*		Ratio of actual to potential production: 1913, 90 per cent., 1924, 85 per cent.	
	1913.	1923.	Cost in 1923 in terms of total 1913 cost taken as 100.	Items of 1923 costs in terms of relative 1913 figures taken as 100.	Cost in 1924 in terms of total 1913 cost taken as 100.	Items of 1924 costs in terms of total 1913 figures taken as 100.
Materials	Per cent 74.7	Per cent 71.8	111.3	149	79.5	131.2
Wages and Salaries	—	—	—	13.9	32.1	231
Wages—Direct	9.5	9.4	14.6	154	8.8	17.9
Indirect	4.7	5.2	8.1	172	1.8	2.7
Total	14.2	14.6	22.7	160	10.6	12.5
Salaries—Office, Management, etc	†	†	—	—	3.3	5.1
Other Expenses	11.1	13.6	21.1	190	6.6	10.5
Power, Light, Water, Heating, etc.	—	—	—	—	1.3	2.0
Depreciation and Maintenance	—	—	—	—	3.0	4.7
Rates, Property Tax and Social Charges	—	—	—	—	0.8	1.7
Other Charges	—	—	—	—	1.5	2.1
Totals	100.0	100.0	135.1	—	100.0	100.0
				162.5	—	100.0
					100.0	120.0
						—

\* On a tonnage basis.

† Firm C was in 1924 making parts that in 1913 were purchased. The 1924 figures of Materials and Wages have, however, been adjusted for that factor. The Materials Cost in 1924 is stated to have been somewhat reduced on 1913 values for comparison owing to modified designs.

‡ Included with Other Expenses

TABLE 13—*cond.*

Ratio of actual to potential production	FIRM D—A SPINNING FRAME.			FIRM E—MEDIUM SIZED ENGINE.			FIRM F—PEDAL BICYCLE.		
	Not stated *			1913, 100 per cent.; 1925, 55 per cent.			1913, 72 per cent., 1924, 65 per cent.		
	Distribution of Cost.		Cost in 1924-25 in terms of total of 1913-14 cost taken as 100.	Distribution of Cost.		Cost in 1925 in terms of total of 1913 cost taken as 100.	Distribution of Cost.		Cost in 1924 in terms of total of 1913 cost taken as 100.
Heads of Cost.	1913-14	1924-25		1913	1925.		1913	1924.	
Materials	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Wages and Salaries	41.4	41.8	72.1	174	140.5	138.3	174.5	184	42.9
Wages—Direct	38.2	43.0	74.1	194	40.4	37.3	72.7	180	32.8
Indirect	32.2	36.1	62.3	193	24.8	19.4	37.9	153	23.7
Total	4.3	5.2	8.9	207	10.9	10.8	21.0	193	7.8
Salaries—Office, Management, etc	36.5	41.3	71.2	195	35.7	30.2	58.9	165	31.5
Other Expenses	1.7	1.7	2.9	171	4.7	7.1	13.8	293	1.3
Power, Light, Water, Heating, etc	20.4	15.2	26.2	128	19.1	24.4	47.5	24.3	27.7
Depreciation and Maintenance	6.2	4.9	3.1	5.4	11.7	13.2	13.6	7.0	45.0
Rates, Property Tax and Social Charges	1.3	1.6	8.5	1.6	1.6	6.7	6.7	216	10.6
Other Charges	8.3	5.6	9.6	11.6	7.4	10.6	20.7	194	**7.2
Totals	100.0	100.0	172.4	—	100.0	100.0	194.7	—	100.0
									162.8§
									—

\* The sterling value of the total output of the works in 1924-25 appears to have been approximately equal to that of the 1913-14 output.

† Materials include, *inter alia*, the full cost, including all materials, wages and works charges necessary for their production, of castings made in the firm's own foundry.

‡ Gas and Water are included under Other Charges.

§ The increase in the 1924-25 sales price of the bicycles over that of 1913 was 34 per cent. only. The manufacture in 1913 was profitable, while that of 1924 was conducted at a loss.

|| The actual capacity of the works increased by 50 per cent between 1913 and 1924.

¶ The firm submitting these figures estimated that the ratio of actual production remained the same in 1925 as in 1913 the total cost would have been reduced to, say, 165 per cent of that of 1913.

\*\* Includes Tool expenditure.

†† The increase is largely due to the fact that in 1924 the manufacturers incurred certain expenses which were borne by selling agents in 1913, particularly the cost of carriage.

## COSTS OF PRODUCTION

TABLE 14.  
ELECTRICAL ENGINEERING

Hrds. of Cost	ELECTRICAL ENGINEERING *				FIRM A—MOTOR †				FIRM B—CABLES			
	Ratio of actual to potential production		Ratio of actual to potential production		1924 turnover, 250 per cent. of that in 1913.		1924 turnover, 250 per cent. of that in 1913.		Cost in 1924 in terms of total 1913 cost taken as 100		Cost in 1924 in terms of total 1913 cost taken as 100	
	Distribution of Cost		Cost in 1923 in terms of total 1913 cost taken as 100		Distribution of Cost		Cost in 1923 in terms of total 1913 cost taken as 100		Distribution of Cost		Cost in 1923 in terms of total 1913 cost taken as 100	
	1913	1923			1913	1923			1913	1923		
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	(Approx.)
Materials	48.3	42.5	77.8	161	46.9	47.2	68.5	146	\$78.1	\$64.9	\$97.6	125
Wages and Salaries	—	—	—	—	—	—	—	—	—	—	—	—
Wages—Direct	—	—	—	—	—	—	—	—	—	—	—	—
Indirect	—	—	—	—	—	—	—	—	—	—	—	—
Total	26.3	28.5	52.1	198	225.2	123.6	31.2	136	12.4	22.3	33.6	271
Salaries—Office, Management, etc	—	—	—	—	—	—	—	—	—	—	—	—
Other Expenses	25.4	29.0	53.1	209	27.9	29.2	42.3	152	9.5	12.8	19.2	202
Power, Light, Water, Heating, etc	—	—	—	—	—	—	—	—	—	—	—	—
Depreciation and Maintenance	—	—	—	—	—	—	—	—	—	—	—	—
Rates, Property Tax and Social Charges	1.5	4.7	8.6	570	—	—	—	—	—	—	—	—
Other Charges	23.9	24.3	44.5	186	—	—	—	—	—	—	—	—
Totals	100.0	100.0	183.0	—	100.0	100.0	145.0†	—	100.0	100.0	150.4	—

\* This section of the table is compiled from information supplied by the British Electrical and Allied Manufacturers Association in relation to cost of production in the electrical industry generally.

† The cost of an exact duplicate of the motor manufactured in 1913 would have been in the ratio of 170 to 100 (Col. 3), but due to engineering activity and designing skill the apparatus had been improved so that the machine produced in 1924 would give the same service at 15 per cent. above 1913 cost.

‡ These items were furnished under the description Labour Cost, Direct and Indirect, and it is specifically stated in this case that improved methods and higher speeds of performing operations have made it possible to effect economy in labour costs per unit of production, which for that reason show an increase of only 36 per cent. above the level of 1913, although

§ Comprises the cost of basic materials, e.g., copper or lead, used in production  
|| Fuel and Power only  
\*\* Included in Other Charges in the case of Firm A in Other Expenses  
\*\* Includes Income Tax

TABLE 15.

## SHIPBUILDING

*Hull of a First-class Passenger and Cargo Steamship \**

Heads of Cost.	Distribution of Cost		Cost in 1925 in terms of total 1914 cost taken as 100	Items of 1925 cost in terms of relative 1914 figures taken as 100.
	1914.	1925.		
Materials† .. ..	60·3	60·5	88·9	148
Wages and Salaries ..	—	—	—	—
Wages—Direct .. ..	—	—	—	—
Indirect .. ..	—	—	—	—
Total .. ..	33·5	33·3	49·0	146
Salaries—Office, Management, etc	‡	‡	‡	—
Other Expenses .. ..	6·2	6·2	9·1	146
Power, Light, Water, Heating, etc.	—	—	—	—
Depreciation and Maintenance	—	—	—	—
Rates, Property Tax and Social Charges	—	—	—	—
Other Charges .. ..	—	—	—	—
Totals ..	100·0	100·0	147·0	—

\* The figures tabulated relate to the cost of the hull of the vessel only, which comprised 71·9 per cent of the combined cost of hull and machinery in 1914 and 67·5 per cent in 1925.

† Described as the cost of Materials and Equipment. It is stated that the increased cost of the steel used in 1925 as compared with 1914 was only a little over 30 per cent, the 48 per cent. increase in the cost of the Materials and Equipment as a whole having been occasioned by greater increases in the cost of timber, auxiliary fittings, etc.

‡ Included in Other Expenses.

## COSTS OF PRODUCTION.

TABLE 16.  
CHEMICALS, ETC.

HEADS OF COST.		BLASTING EXPLOSIVES §				DYES, †				HOUSEHOLD SOAP							
		1913-14, 83 per cent, 1924-25, 83 per cent		1912, 86 per cent, 1924, 83 per cent		Not stated		1913, 96 per cent, 1924, 90 per cent		1913, 96 per cent, 1924, 90 per cent		1913, 96 per cent, 1924, 90 per cent					
		Distribution of Cost	Cost in 1924-25 in terms of total 1913-14 cost taken as 100.	Distribution of Cost	Cost in 1924-25 in terms of total 1912 cost taken as 100.	Distribution of Cost	Cost in 1924-25 in terms of total 1912 cost taken as 100.	Distribution of Cost	Cost in 1924-25 in terms of total 1913 cost taken as 100.	Distribution of Cost	Cost in 1924-25 in terms of total 1913 cost taken as 100.	Distribution of Cost	Cost in 1924-25 in terms of total 1913 cost taken as 100.				
Wages and Salaries—Direct	28.7	29.6	30.2	175	71.3	60.9	81.2	114	33.0	27.8	61.3	188	85.0	79.9	136.2	160	
Indirect	—	—	10.7	—	18.1	177	71	—	23.2	12.5	64.1	226	6.7	10.1	17.2	25.6	
Total Wages and Salaries—Office, Management, etc.	19.9	20.6	9.7	34.9	16.8	173	10.3	13.7	193	—	*8.4	*28.1	2.75	—	—	—	
Indirect	—	—	—	—	—	—	—	—	—	20.9	26.1	57.7	276	5.4	8.8	14.7	27.2
Arteries—Office, Management, etc.	—	—	—	—	—	—	—	—	—	2.3	2.9	6.4	275	1.3	—	—	189
Expenses—Water, Light, Heating, etc.	51.4	49.8	17.1	84.6	165	21.6	28.8	38.5	178	43.8	43.2	95.3	218	8.3	10.0	17.1	20.7
Maintenance, Property Tax and Social Charges	18.0	22.4	24.6	38.1	161	6.4	8.2	11.0	172	11.7	12.6	27.8	238	2.0	1.7	2.9	14.6
Indirect	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	182
Total	100.0	100.0	100.0	169.7	—	100.0	100.0	133.4	—	100.0	100.0	220.7	—	100.0	100.0	170.5	—

\* State insurance and workmen's compensation are included in Indirect Wages.

† The Materials cost represents the purchase cost of a representative range of basic raw materials into terms of intermediates and eventually into terms of dyestuffs are contained in the other heads of cost. The 1913 Materials cost represents what would have been the cost in 1913 of the exact quantities of materials taken for 1924.

‡ Included in Other Charges

§ Total factory cost only.

|| Including fire and guarantee insurance.

TABLE 17.  
COTTON SPINNING.

YARN A—AMERICAN COTTON, 36s TWIST.				YARN B—AMERICAN COTTON, 42s. WEFT.				YARN C—EGYPTIAN COTTON 80s. DOUBLING WEFT.				Yarn D—EGYPTIAN COTTON, 100s. DOUBLING WEFT.				
Distribution of Cost.		Items of cost in 1925 in terms of total 1914 cost taken as 100.		Distribution of Cost		Items of cost in 1925 in terms of total 1914 cost taken as 100.		Distribution of Cost		Items of cost in 1925 in terms of total 1914 cost taken as 100.		Distribution of Cost		Items of cost in 1925 in terms of total 1914 cost taken as 100.		
1914	1925.	1914	1925.	1914	1925.	1914	1925.	1914	1925.	1914	1925.	1914	1925.	1914	1925.	
Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	
76.3	73.2	75.8	72.7	202	153.9	151.2	200	64.1	74.4	203.8	318	58.6	71.3	195.7	334	
*12.7	*12.8	*27.0	21.3	*13.2	*13.1	*27.4	206	22.5	16.2	44.5	198	25.4	17.9	49.1	193	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salaries—Office, Management, etc	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salaries—Office, Management, etc	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Power, Light, Water, Heating, etc	11.0	14.0	29.4	4.2	189	11.0	14.2	29.4	191	13.4	9.4	25.9	193	16.0	10.8	29.8
Depreciation and Maintenance, Property Tax and Other Charges	17.7	19.4	19.7	23.7	47.8	19.4	19.6	19.6	252	9.1	5.9	6.2	186	3.9	2.5	6.9
Other Charges	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	..	100.0	100.0	210.3	—	100.0	100.0	208.0	—	100.0	100.0	274.2	—	100.0	100.0	274.6

*Note*—These tables are stated to be based on a number of typical mills and in the case of the American cotton yarns the costs are based on the working of a full working week of 55½ hours in 1914 and of 48 hours in 1925.

\* Comprises "Wages Costs including Management."

† Including Interest.

‡ Including Interest and Management.

TABLE 18  
COTTON WEAVING.

Heads of Cost	A.—PRINTERS' CLOTH				B.—FINE WOVEN CLOTH				C.†			
	Production in 1924-25, 86 per cent of that of 1913		Distribution of Cost,		Cost in 1924 in terms of 1924-25 cost relative 1913 cost taken as 100		Distribution of Cost		Cost in 1924 in terms of 1924-25 cost relative 1913 cost taken as 100.		Distribution of Cost	
	1913	1924-25 *	1913	1924	1913	1924	1913	1925	1913	1925	1913	1925
Materials	76.3	78.5	178.8	234	73.1	73.9	154.5	211	74.1	73.9	189.6	256
Wages and Salaries	20.7	18.7	42.7	20.5	23.2	21.5	45.1	19.4	—	—	—	—
Wages—Direct	19.0	16.6	37.9	19.9	21.5	20.4	42.7	19.9	16.4	12.9	31.0	188
Indirect	1.1	1.4	3.2	2.86	0.7	0.5	1.0	1.37	2.7	2.0	4.8	182
Total	20.1	18.0	41.1	20.4	22.2	20.9	43.7	19.7	19.1	14.9	35.8	188
Salaries—Office, Management, etc	10.6	10.7	11.6	26.1	11.0	10.6	11.4	14.4	—	—	—	—
Other Expenses	3.0	2.8	6.3	21.2	3.7	4.6	9.4	25.4	6.8	6.2	15.1	222
Power, Light, Water, Heating, etc	1.2	1.1	2.4	20.9	1.4	0.9	1.9	1.37	1.1	0.7	1.7	153
Depreciation and Maintenance	1.2	0.8	2.0	16.6	1.3	2.1	4.4	32.8	54.3	\$3.4	\$8.1	185
Rates, Property Tax and Social Charges	0.4	0.7	1.5	41.6	0.3	1.0	1.7	71.7	110.9	114.7	557	557
Other Charges	0.2	0.2	0.4	1.55	0.7	0.6	1.4	19.4	0.5	0.2	0.6	133
Totals .	100.0	100.0	227.8	—	100.0	100.0	209.0	—	100.0	100.0	240.5	—

\* Year to June 1925

† Compiled from figures of Comparative Cost of a Piece of Cloth furnished by the Cotton Spinners' and Manufacturers' Association described as Other Wages  
‡ Directors or Partners' salaries only  
§ Including interest  
|| Including insurance.

Items of cost in terms of relative 1913 figures taken as 100.

Items of cost in terms of relative 1913 figures taken as 100.

Items of cost in terms of relative 1913 figures taken as 100.

TABLE 19.  
HOSTERY.

Heads of Cost	MEN'S UNDERWEAR		KNITTED GOODS.	
	Ratio of actual to potential production. 1913, 83 per cent., 1924, 43 per cent.		Production in 1924 125 per cent. of that in 1913 *	
	Distribution of Cost.	1913	1924	1913
Materials	..	67.8	60.3	136 65.8
Wages and Salaries	..	25.6	30.2	181 26.3
Wages—Direct	..	21.3	22.0	158 19.1
Indirect	..	1.3	2.7	323 28.5
Total	..	22.6	24.7	37.8 7.2
Salaries—Office, Management, etc	..	3.0	5.5	8.5 21.5
Other Expenses	..	6.6	9.5	14.5 7.9
Power, Light, Water, Heating, etc	..	0.7	0.7	1.1 0.5
Depreciation and Maintenance	..	2.0	2.0	3.0 3.0
Rates, Property Tax and Social Charges	..	0.5	1.2	1.9 0.6
Other Charges	..	3.4	5.6	8.5 250
Totals	..	..	100.0	153.1 —
				100.0 100.0

\* On the basis of dozens manufactured

TABLE 20.  
READY MADE CLOTHING.

Heads of Cost	A *		B.*		C.		D Distribution of Cost, 1925.	
	Distribution of Cost		Distribution of Cost.		Distribution of Cost			
	1913	1924	1913	1924	1913	1924		
Materials	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	
Wages and Salaries	†41.3	†34.5	†75.3	182	†34.0	†63.7	55.2	
Wages—Direct	54.0	56.8	124.1	230	37.5	—	36.1	
Indirect	47.2	46.6	101.8	216	50.0	52.5	25.7	
Total	6.8	10.2	22.3	325	§	§	30.3	
Salaries—Office, Management, etc	4.7	8.7	19.1	410	12.5	13.5	8.7	
Other Expenses	1.1	1.6	3.5	317	—	—	5.8	
Power, Light, Water, Heating, etc	1.7	2.5	5.5	324	—	—	—	
Depreciation and Maintenance Rates, Property Tax and Social Charges	1.3	3.0	6.5	498	—	—	1.4	
Other Charges	0.6	1.6	3.6	661	—	—	10.4	
Totals .	100.0	218.5	—	100.0	100.0	187.7	100.0	
						—	100.0	
						—	100.0	

Note—Owing to the changes in styles and cloths the comparisons made between the pre-war and the post-war figures must be regarded as furnishing a general indication only of the increase in cost.

\* Makang and trunning only. The cost of the cloth is excluded.

† Trunning only.

‡ State insurance is included in Indirect Wages.

§ Included in Other Expenses.

|| Including Rent.

TABLE 21.  
BOOTS AND SHOES.

Ratio of actual to potential production.	A—AVERAGE OF FOUR FIRMS.			B—AVERAGE OF 35 FIRMS.			C.			D.		
	Not stated.		Not stated	1913, 70 per cent, 1924, 88 per cent.			1912, 88 per cent, 1924, 82 per cent.			1912, 88 per cent, 1924, 82 per cent.		
	Distribution of Cost	Cost in 1924 in terms of total 1913 cost taken as 100.		Distribution of Cost	Cost in 1924 in terms of total 1913 cost taken as 100.	Items of 1924 cost in terms of total 1913 cost taken as 100.	Distribution of Cost	Cost in 1924 in terms of total 1913 cost taken as 100.	Items of 1924 cost in terms of total 1913 cost taken as 100.	Distribution of Cost	Cost in 1924 in terms of total 1912 cost taken as 100.	Items of 1924 cost in terms of total 1912 cost taken as 100.
Heads of Cost	1913.	1924.		1913.	1924.		1913.	1924.		1912.	1924.	
Materials	Per cent	Per cent		Per cent	Per cent		Per cent	Per cent		Per cent	Per cent	
Wages and Salaries	*63.6	*57.2	*116.8	18.4	*70.5	*62.1	*114.1	162	65.6	110.3	162	65.9
Wages—Direct	123.9	126.6	154.4	22.8	21.3	130.2	155.4	260	23.3	27.4	197	28.5
Indirect	4	4	4	—	—	—	4	—	—	—	—	—
Total	127.9	126.6	154.4	22.8	21.3	130.2	155.4	260	21.1	23.7	189	25.0
Salaries—Office, Management, etc.	—	—	—	—	—	—	—	—	2.2	3.7	6.2	2.2
Other Expenses	812.5	816.2	833.1	264	8.2	7.7	14.2	172	8.5	7.0	11.7	138
Power, Light, Water, Heating, etc.	—	—	—	—	—	—	—	—	1.2	1.0	1.7	1.2
Depreciation and Maintenance	—	—	—	—	—	—	—	—	*5.6	*3.9	*6.6	11.9
Rates, Property Tax and Social Charges	—	—	—	—	—	—	—	—	0.6	1.0	1.6	281
Other Charges	—	—	—	—	—	—	—	—	1.1	1.1	1.8	164
Totals	100.0	100.0	204.3	—	100.0	100.0	183.7	—	100.0	100.0	168.1	—
											100.0	100.0
											177.4	—

Note.—The figures relating to four firms and to 35 firms were supplied by the Incorporated Federated Associations of Boot and Shoe Manufacturers who state that in view of (a) the fact that the character of the shoes produced in 1924 as compared with those produced in 1913 was different and required much more labour cost, especially in the upper, than the very plain and massed production type of shoe that was being manufactured in 1913 and (b) the fact that costs vary according to the grade of goods and that individual firms do mixed trade in men's, women's and children's goods, it is difficult to obtain really comparable pre-war and post-war figures, and those furnished should be regarded as furnishing a general indication only in regard to increase in cost of 1924 over 1913.

\* Including royalties for the use of patent machinery.

† Included in other Expenses.

‡ Described as the cost of Productive Labour.

§ Described as Factory and Warehouse Oncost.

COPY OF THE SCHEDULE EMPLOYED IN THE COLLECTION OF  
THE COSTS DATA

1. The Committee on Industry and Trade are endeavouring to ascertain what proportions of the total cost of production in various industries are due to the various elements in costs such as *Wages, materials, and overhead charges*. They also wish to ascertain how the post-war proportions for these elements compare with the corresponding pre-war figures

2 For the foregoing purpose, the Committee desire to obtain particulars relating to representative commodities in a number of industries, and the attached schedule has been prepared to show the general character of the information desired. The schedule will, no doubt, require modification and adaptation according to the particular industry and commodity dealt with. No figures of actual cost (in £. s. d.) are asked for, but only proportions. The figures are intended to refer to some convenient quantity ( $x$  yards,  $y$  tons,  $z$  pairs or dozens, etc.), and it is suggested that, for convenience, the various items should be expressed as parts of 1,000.

3 The commodities selected for examination should be typical and representative of a large volume of production, and should, if possible, be identical and produced by the same processes in the two years compared. If the last-mentioned condition cannot be fulfilled, products should be selected which comply as nearly as possible, and information should be given as to the differences between the two, and, if possible, the effect of these differences on the various factors entering into the analysis should be estimated.

4 The following explanatory notes are intended as a guide in filling up the attached schedule —

(a) *Years for Comparison.*

If the years 1913 and 1924 are inconvenient, please substitute the nearest pre-war year and the latest post-war year for which the figures can be given

(b) *Process Costs.*

Where the commodity dealt with is the result of several successive processes carried on in the works (e.g. spinning, weaving and dyeing), and a separate analysis of each process can be given, this should be done.

(c) *Detailed Analysis (Section C).*

As already stated, the schedule may require modification and adaptation in particular cases, and this applies especially to Section C. The extent to which that Section can be completed in each case will depend on the costings system used in the works, and the applicability of the items enumerated in the Section to the case. In some cases, items which do not appear in the Schedule may be of importance and should, of course, be inserted. In all cases, those items which are not applicable should be deleted, and where separate figures for particular items cannot be given, they should be included in the item "other expenses."

(d) *Materials used (Sections B and C).*

The market and *not cost price* of materials used should be taken where the firm produce or control their own Materials. In cases where two or more kinds of materials enter to an important degree into the products (e.g. steel and tin in tinplates, wool and jute in carpets, hides and tanning materials in leather), these should be given separately in Section C if possible

(e) *Rent (Section C).*

Where the Works and Premises are freehold, please state how the charge equivalent to Rent is computed

(f) *Directors' or Partners' Salaries (Section C).*

Directors' Fees should be excluded

(g) *Cost-figures (Sections B and C)*

The productions making up 1,000 representing the total cost in 1913 will, of course, be based on actual money cost, though no money figures need be shown

The figure representing the total cost in 1924 will be ascertained by dividing the actual *total money cost in 1924* by the *actual total money cost in 1913* and multiplying by 1,000, e.g.

$$\begin{array}{l} \text{Total money cost in 1924} = \text{£}2,210 \\ \text{Total money cost in 1913} = \text{£}1,300 \end{array} \times 1,000 = 1,700.$$

Similarly, the figures for the detailed items of cost in 1924 will be ascertained by substituting for the above "dividend" the money cost of the separate items and multiplying by 1,000, thus—

$$\begin{array}{l} \text{Cost of wages in 1924} = \text{£}1,040 \\ \text{Total money cost in 1913} = \text{£}1,300 \end{array} \times 1,000 = 800$$

The total of the separate items of cost in 1924 should then correspond with the *Total Cost in 1924* shown in the above example as 1,700.

## SCHEDULE

Section A *Particulars of Commodity, etc*

Article selected for comparison ....			
Quantity to which the comparison applies			
Potential Maximum Output.... . . .	1913	1924.	
Actual quantity produced.....			

Section B. *Summary Analysis*

	1913	1924 (based on year 1913, 1,000)	
Total cost of production (excluding all interest) .....	1,000		
Comprising —			
Wages .....			
Materials used .....			
Overhead charges .....			
	1,000		

## Section C. Detailed Analysis.

	1913.	1924	
DIRECT CHARGES.			
Materials used .....			
Wages .....			
Works expenses .....			
Non-productive Wages and Salaries..			
National Health Insurance and Unemployment Insurance.....			
Workmen's Compensation .....			
Rent .....			
Rates .....			
Maintenance of plant and buildings..			
Depreciation of plant and buildings..			
Fuel and motive power.....			
Lighting, heating and water.....			
Royalties .....			
Other expenses .....			
PRIME COST			
INDIRECT CHARGES.			
Rent .....			
Rates .....			
Maintenance .....			
Depreciation .....			
Lighting, heating, and water .....			
Administrative and office staff .....			
Directors' or partners' salaries.....			
Selling expenses, including travelling .....			
Other expenses .....			
TOTAL COST (excluding all interest)			
	1,000		

*Note*—Actual money costs are not asked for. Each item is to be expressed as so many parts of the 1,000 at foot of Column 1 (year 1913). The increases in costs for 1924 will appear in Column 2 and the total at the foot of this column will reflect the increase of charges on the 1913 basis.

*See also Note 4 (g).*

## APPENDIX II.

## TABLES OF COSTS OF DISTRIBUTION.

Wholesale Distribution—	Page.
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“ 2. Drapery and Clothing .. .. .. .. ..	154
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## Retail Distribution—

Table 5. General Supply Stores .. .. .. .. ..	157
“ 6. Grocery and Provisions .. .. .. .. ..	158

## Note.

*Classification.*—The expenses of the distributive businesses have been grouped under four heads, viz. :—

(a) Wages, Salaries and State Insurance.

(b) Selling Expenses, including, so far as can be ascertained from the particulars furnished, the cost of delivery, advertising and agency, printing, stationery, travelling, postages, telegrams, telephones, etc.

(c) Premises, comprising the cost of rent (if any), rates, power, heat, light, water, insurance and repairs, maintenance and depreciation of properties.

(d) Other expenses.

Inasmuch as the information tabulated was submitted to the Committee in varying forms, certain differences of classification are unavoidable. Wherever such differences are known to exist attention is called to them by footnotes.

*Interest.*—It is usual in the accounts of a co-operative society to include as an expense interest on the value of buildings, fixtures and stocks. Except where otherwise stated, such interest has been excluded from the expenses tabulated.

TABLE 1.  
Wholesale Distribution—General Trade.

	Co-operative Wholesale Society A—All Departments.		Co-operative Wholesale Society B—Grocery, Drapery, Boots and Furniture Depts.	
	Year 1913-14.	Year 1924-25.	1913	1924.
I. Make-up of Selling Prices.				
Purchases (after stock adjustment).	95.9	96.7	93.8	95.3
Expenses ..	1.8	1.9	2.2	3.0
Wages, Salaries and State Insurance.	1.0	1.2	(a) 1.3	(a) 1.8
Selling Expenses ..	0.3	0.3		
Premises .. ..	0.3	0.3	0.9	1.2
Other Expenses ..	0.2	0.1		
Surplus .. .. ..	2.3	1.4	4.0	1.7
Net Sales .. ..	100.0	100.0	100.0	100.0
II. Comparison of Gross Margin and Expenses				
Percentages on Net Sales —				
Gross Margin ..	4.1	3.3	6.2	4.7
Expenses .. ..	1.8	1.9	2.2	3.0
Surplus .. ..	2.3	1.4	4.0	1.7

(a) Excluding State Insurance, which is included in Other Expenses

TABLE 2.  
*Wholesale Distribution—Drapery and Clothing.*

I Make-up of Selling Prices	A Wholesale Textile House.		Co-operative Wholesale Society A.		Co-operative Wholesale Society B.	
	1913		1924.		Drapery.	
	Year 1913-14	Year 1924-25	Year 1913-14	Year 1924-25	Woolens and Ready-Mades.	Drapery.
Purchases (after stock adjustment)	86.4	86.0	90.6	90.6	89.7	89.3
Wages, Salaries and State Insurance	11.9	12.6	5.4	6.9	5.5	4.2
Selling Expenses ..	..	† 4.4	† 4.6	1.0	1.4	1.8
Premises ..	..	1.1	1.2	0.8	0.7	0.9
Other Expenses ..	..	† 0.3	† 0.3	0.3	0.3	0.4
Surplus ..	..	1.7	1.4	4.0	2.5	3.1
Net Sales ..	..	100.0	100.0	100.0	100.0	100.0
II Comparison of Gross Margin and Expenses						
Percentages on Net Sales —						
Gross Margin ..	13.6	14.0	9.4	10.0	10.3	10.7
Expenses ..	11.9	12.6	5.4	6.9	5.5	4.2
Surplus ..	..	1.7	1.4	4.0	2.5	6.5

\* Including directors' fees—see also note <sup>†</sup>

<sup>†</sup> Including "Cost of travellers," 3.4 in 1913 and 3.5 in 1924, "Allowances to Customers (goods missing in transit, etc.)," and "Incidental and extraordinary trade expenses."

<sup>‡</sup> Bad debts only—see also note <sup>†</sup>

<sup>§</sup> Excluding State Insurance, which is included in Other Expenses.

TABLE 3.

*Wholesale Distribution—Grocery and Provisions.*

	Co-operative Wholesale Society A		Co-operative Wholesale Society B.	
	Year 1913-14.	Year 1924-25.	1913.	1924.
<b>I. Make-up of Selling Prices</b>				
Purchases (after stock adjustment)	96.8	97.6	95.4	96.8
Expenses .. ..	1.1	1.0	1.3	2.0
Wages, Salaries and State Insurance.	0.6	0.6	(a) 0.7	(a) 1.0
Selling Expenses ..	0.2	0.2		
Premises ..	0.2	0.1	0.6	1.0
Other Expenses ..	0.1	0.1		
Surplus ..	2.1	1.4	3.3	1.2
Net Sales .. . .	100.0	100.0	100.0	100.0
<b>II Comparison of Gross Margin and Expenses</b>				
Percentages on Net Sales —				
Gross Margin ..	3.2	2.4	4.6	3.2
Expenses .. ..	1.1	1.0	1.3	2.0
Surplus .. ..	2.1	1.4	3.3	1.2

(a) Excluding State Insurance, which is included in Other Expenses.

TABLE 4.

*Wholesale Distribution—Boots and Shoes.*

	Co-operative Wholesale Society A.		Co-operative Wholesale Society B.	
	Year 1913-14.	Year 1924-25.	1913	1924
I. <i>Make-up of Selling Prices</i>				
Purchases (after stock adjustment).	94.2	94.2	92.1	90.2
Expenses .. ..	3.6	4.2	3.3	5.9
Wages, Salaries and State Insurance	2.2	2.7	(a) 2.2	(a) 3.4
Selling Expenses ..	0.5	0.6		
Premises .. ..	0.6	0.6		
Other Expenses ..	0.3	0.3		
Surplus .. .. ..	2.2	1.6	4.6	3.9
Net Sales .. ..	100.0	100.0	100.0	100.0
II. <i>Comparison of Gross Margin and Expenses.</i>				
Percentages on Net Sales —				
Gross Margin ..	5.8	5.8	7.9	9.8
Expenses .. ..	3.6	4.2	3.3	5.9
Surplus ..	2.2	1.6	4.6	3.9

(a) Excluding State Insurance which is included in Other Expenses

## COSTS OF DISTRIBUTION.

TABLE 5.  
*Retail Distribution—General Supply Stores (All Departments).*

	Co-operative Societies.						London Departmental Stores.			
	A.		B.*		C.		A.		B.	
	1913	1925.	1913	1925.	1913	July half-year 1925.	1913.	1924.	1913.	1925.
I.— <i>Make up of Selling Prices</i>										
Purchases (after stock adjustment)	79.0	77.2	81.8	81.1	80.3	79.9	82.8	75.4	76.6	72.3
Expenses	12.6	16.5	10.2	10.4	10.4	9.3	13.2	14.2	20.6	16.0
Wages, Salaries and State Insurance	8.5	—	—	—	8.4	8	8.0	7.8	12.5	9.7
Selling Expenses	1.7	2.9	—	—	—	—	—	—	—	12.0
Premises	2.2	3.2	—	—	—	—	—	—	—	—
Other Expenses	0.2	0.2	—	—	—	—	—	—	—	—
Surplus	..	8.4	6.3	10.4	8.5	10.4	6.9	5.2	—	—
Net Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
II.— <i>Comparison of Gross Margin and Expenses</i>										
Percentage on Net Sales	—	—	—	—	—	—	—	—	—	—
Gross Margin	..	21.0	22.8	18.2	18.9	19.7	20.1	17.2	24.6	23.4
Expenses	..	12.6	16.5	10.4	10.4	9.3	13.2	14.2	20.6	16.0
Surplus	..	8.4	6.3	—	8.5	10.4	6.9	3.0	4.0	7.4

\* Excluding four departments, together comprising about one-tenth of the total annual trade, for which details are not available.

† Omits wrapping paper, bags and string, the cost of which is included above with Purchases.

‡ Including interest on buildings, fixtures and stocks.

§ Excluding State Insurance.

TABLE 6.  
*Retail Distribution—Grocery and Provisions Businesses or Departments.*

	Proprietary Businesses—Year 1924-25.*					Co-operative Societies.							
	A.	B.	C.	D.	E.	F.	1913.	1925.	1913.	1925.	1913.	C	
I.— <i>Make-up of Selling Prices</i>													
Purchases (after stock adjustment)	84.0	86.5	84.0	84.4	85.0	83.9	80.8	83.0	83.0	84.1	80.4	81.6	
Wages, Salaries and State Insurance	14.4	8.2	11.7	7.3	8.3	12.9	11.5	13.6	6.0	8.4	8.8	11.0	16.8
Selling Expenses, including Delivery	6.0	4.7	5.9	4.4	4.8	8.2	—	—	—	—	—	—	14.2
Premises	1.5	1.4	2.2	1.3	1.8	1.8	—	—	—	—	—	—	4.2
Other Expenses, . . .	6.1	1.5	3.0	1.0	1.1	2.4	—	—	—	—	—	—	6
Surplus	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	7.4
Net Sales	1.6	5.3	4.3	8.3	6.7	3.2	7.7	3.4	11.0	7.5	10.8	10.8	
II.— <i>Comparison of Gross Margin and Expenses</i>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Percentage on Net Sales—													
Gross Margin	16.0	13.5	16.0	15.6	15.0	16.1	19.2	17.0	15.9	19.6	18.4	19.6	
Expenses	14.4	8.2	11.7	7.3	8.3	12.9	11.5	13.6	6.0	8.4	8.8	11.0	
Surplus	1.6	5.3	4.3	8.3	6.7	3.2	7.7	3.4	11.0	7.5	10.8	10.8	7.4

\* The proprietary businesses are arranged in order according to size of turnover for the year, ranging from £5,300 for A to £18,100 for E and £82,200 for F. Business F is that of a limited liability company, and in that case the directors' remuneration is included in the figures against the main heading Expenses and the subsidiary heading Wages, Salaries and State Insurance, in the case of the other five proprietary businesses the salaries or drawings of the proprietors are excluded from these headings and included in Surplus. Nothing appears to be included for depreciation of premises or fixtures except in the case of business F. Business B is stated to be in a rural district, and business E includes an outdoor wine and spirit trade.

† Includes Bread and Confectionery stakes

‡ Excluding State Insurance.

§ See note \* above.

|| Excluding interest on the value of buildings, fixtures and stocks.

## APPENDIX III.

## NOTES ON COSTS OF PRODUCTION IN THE METALLURGICAL COKE, IRON, STEEL AND ENGINEERING INDUSTRIES.

## Metallurgical Coke.

Metallurgical coke is one of the most important factors in the cost of pig iron, in the manufacture of which some 75 to 80 per cent. of the coke oven output retained for home consumption is used. In the specimen cost of production of hematite pig iron given in a summarised form in the Table on page 133 the details furnished to the Committee showed that both in 1913 and in 1924, the cost of coke accounted for more than 33 per cent. of the total cost of production. In the case of basic pig iron, the total cost of which is less than that of hematite, more coke is required per ton of iron owing to the large proportion of ore of low metallic content used. The Statistics of the National Federation of Iron and Steel Manufacturers show that while on an average slightly more than 20 cwt. of coke were used in 1924 and 1925 per ton of hematite pig iron manufactured, 27½ cwt. in 1924 and roughly 26 cwt. in 1925 were used per ton of basic pig, and 22½ cwt. in 1924 and 24 cwt. in 1925 were consumed per ton of forge and foundry pig.

*Factors affecting the cost of production at different ovens.*

The principal element in the cost of producing coke, which differs according to whether furnace or foundry coke is being manufactured, is the cost of coals, and this varies according to the quality and kind used, and with the distance of the coking plants from the collieries. Figures submitted to the Royal Commission on the Coal Industry (1925) showed that in the period 1 January to 31 July, 1925, the average price per ton of coals at ovens was 12s 2·16d. in the case of ovens owned by colliery companies alone, where the ovens were situated at or near the collieries; 15s. 1·67d in the case of ovens owned by iron and steel firms and 14s 5·54d where the ovens were owned by collieries and iron and steel firms combined, these two classes comprising the long distance traffic such as that of coking coal sent from Yorkshire to Scunthorpe in Lincolnshire or from Durham to Skinningrove Ironworks in Cleveland, and 11s 8·19d in the case of independently owned ovens, which were mainly situated within easy distance of the collieries.

Figures submitted to the Committee of the cost of coals at separate plants associated with, and situated near, collieries show as wide a variation as 3s 8d per ton of coke made.

The quality and kind of coal used also affect the process costs of coke making, as do, moreover, the type of oven used, and the amount of oven repairs executed. The process costs of a number of separate plants were stated to the Committee as ranging from 3s 6d. to 6s. 7d per ton of coke. In examples furnished to the Committee the "coke burning" labour cost was 1s 10 56d per ton of coke for one plant and 2s 5·27d for another, while the cost of labour employed on repair work ranged from 1·62d per ton of coke to 1s. 0 52d.

*Changes affecting costs of production as compared with the pre-war period.*

The industry in post-war years, as compared with the pre-war period, has undergone great changes. The first of these is in the type of oven. In 1913, out of some 21,000 ovens in use during the year roughly only 6,000 were

bye-product recovery ovens while over 13,000 were of the beehive type. The position had so far changed in 1924 that of approximately 12,000 ovens in use, more than 9,000 were bye-product recovery ovens. The importance of this change in regard to the costs\* of the industry is exemplified by the fact that while the 1912 Census of Production showed that the value of the bye-products represented only 18 per cent. of the gross output of coke ovens, the 1924 Census showed them to amount to 31 per cent of the gross output. The value of the bye-products had therefore increased from some 22 per cent. to approximately 45 per cent of that of the coke produced. Another of the changes is in the coking quality and the extent of the preliminary treatment of the coal used. The bye-product oven has enabled coal which had been regarded as non-coking in old days to be manufactured into satisfactory metallurgical coke. Yet another change has resulted from the practice of placing new ovens in proximity to iron and steel works in order that the fullest use may be made of the surplus gases. The amount of gas available in the case of regenerative ovens is stated to be approximately 5,000 cubic feet of gas per ton of coal carbonised, or probably 7,500 cubic feet per ton of coke made, while the heat equivalent of the hot waste products and gas of waste heat ovens is stated to be approximately the same. As 27½ cwts. of coke were used on an average in the manufacture of a ton of basic pig iron in 1924, it will be seen that where regenerative or waste heat coke ovens are associated with iron and steel plants, some 10,000 cubic feet of gas, or its equivalent in heat, was made available, for each ton of pig iron manufactured. The gases generated by coke ovens not associated with iron or steel works are in many cases disposed of to public authorities and public utility undertakings for lighting purposes, as in Middlesbrough, Pontypridd, Sheffield, Leeds and Chesterfield, or for power purposes, as for example in the case of the gas sold to the North East Coast electric power system, which covers the whole of the County of Durham and a portion of North Yorkshire, and to the Yorkshire Electric Power Co., which covers the West Riding of Yorkshire. The value of the waste heat (including gas) sold by coke oven undertakings in 1924, is revealed by the Census of Production to have amounted to £465,000, i.e. roughly 9d per ton of coke made, or nearly 2 per cent. of the total output of the whole industry, including all non bye-product recovery ovens and ovens associated with iron and steel works.

The changes mentioned have resulted in a measure of geographical redistribution of the coking industry. In particular Yorkshire has increased in importance, while Durham has relatively decreased. In 1920, Yorkshire had almost doubled the number of bye-product recovery ovens she possessed in 1913 and had in fact a larger number than Durham, whose capacity, measured in numbers, had increased only some 25 per cent, and the Yorkshire output had increased over its 1913 level by 903,150 tons while that of Durham had decreased by 968,874 tons. The industry had also made its appearance in Lincolnshire, a county that had no coking plant in 1913, but had installed 184 bye-product recovery ovens by 1920.

The importance of linking coke production to iron and steel manufacture is not solely a matter of fuel economy. Iron and Steel manufacturers own or control some 54 per cent of their metallurgical coke supply, but the remaining 46 per cent is bought from independent undertakings and any sharp rise in the market price of coke would have an important effect on the pig iron and steel costs concerned. While it is stated that the capacity of the industry is sufficient to supply all potential demands of the iron and steel industry, it is by no

\* Mr F. W. Harbord, in his presidential address to the Iron and Steel Institute in May, 1927, stated that the capital cost of the modern bye-product coke oven plant per ton of annual production was in 1912 about 13s per ton as against 3s per ton for the old beehive type of oven, but the greatly increased yield of coke, the recovery of bye-products and general reduction in working charges had justified the increased expenditure.

means clear that a substantial increase in the demand for coke such as would accompany a general increase of activity in steel production would not lead to substantial increases in the market prices. In 1923, when the total production of metallurgical coke amounted to 13,418,314 tons as compared with 12,753,358 tons in 1924 and 11,008,686 tons in 1925, the average quoted price of Durham furnace coke, delivered at Tees-side works or at Middlesbrough, was approximately 39s. a ton, as compared with an average of 28s. a ton in 1924 and of 21s. 6d. in 1925. It must be remembered that the price of coke in 1923 was greatly affected by a large overseas demand consequent on the cessation of production in the Ruhr, but the fact that the coke market is very sensitive to the fluctuations of supply and demand appears to be confirmed by the widely varying levels of the monthly average prices, which, being average, do not reflect the full extent of fluctuations in price. They varied from 26s. to 18s. a ton in 1913, from 31s. to 44s. 6d. in 1923, from 25s. to 36s. 7½d. in 1924 and from 18s. 7d. to 24s. 7d. in 1925. There appears to be some danger therefore, in so far as iron and steel manufacturers do not own or control their coke supply, that on a large increase in demand such as the iron and steel industry is equipped for, the market prices of coke may again, as in 1923, be so high as to make pig iron production practically unremunerative (*cf.* page 87).

### Pig Iron.

#### *Decline in output.*

The output of pig iron in Great Britain during post-war years has been on a much smaller scale than in the years immediately preceding the war. An important reason for the decline has been the increased use of scrap in the manufacture of steel—for which the greater part of the pig iron production is used. No less than 4,194,418 tons of scrap were used, together with 4,480,779 tons of pig iron, in steel production in 1924, and as much as 4,671,912 tons of scrap with 4,316,553 tons of pig iron in 1923, while in 1913 probably some 2,000,000 tons of scrap were used with some 6,000,000 tons of pig. While, therefore, the total amount of steel ingots and castings made in 1924 was greater than in 1913, the production of hematite and basic pig iron for steel manufacture had fallen from 6,134,600 tons in 1913 to 4,787,600 tons in 1924. The requirements in Forge and Foundry pig iron have also greatly contracted. The production of forge pig iron fell from 1,300,800 tons in 1913 to 375,900 tons in 1924, while that of foundry pig iron was reduced from 2,500,800 tons to 1,802,600 tons.

The effect of the decline in output in increasing overhead charges per ton in post-war as compared with pre-war years will be obvious.

#### *Increased cost of materials.*

The bulk of pig iron cost (some 80 per cent. as shown in Tables 4 and 6 of Appendix I, pages 130 and 132), is accounted for by Materials, of which the principal are coke or coal,\* and iron ore or ironstone. The importance of the cost of coke has already been touched upon. The increases in the cost of iron ore and ironstone as between 1913 and 1924 appear to have been moderate. The average price per ton of British hematite ore was in 1924 21s. 9d., only some 21 per cent over its 1913 level of 17s. 11d., that of Cleveland ironstone 6s. 11d., as compared with 5s. 1d. in 1913, an increase of

\* The costs of coal getting have been the subject of elaborate investigation by the Royal Commission on the Coal Industry (1925), a summary of whose Report is set out in the Chapter relating to Coal Mining in the "Survey of Metal Industries." In view of the special investigation into the costs of that industry, it is not proposed to deal with them in this memorandum. Full details as to the cost of coal production (by districts) are published quarterly by the Mines Department.

approximately 36 per cent., and those of the cheaper Jurassic ironstones of Lincolnshire and the Midlands, which had a general average of 2s. 2d. per ton in 1913, ranged from 2s. 8d. to 3s. 3d. in 1924. A greater increase is shown in the average price of the coal measure ironstone of North Staffordshire which was 7s. 8d. a ton in 1913 and 13s. 1d. a ton in 1924. Foreign ore, apart from manganeseiferous ore, imported showed an increase in price on an average of only some 16 per cent.

Costs have been further increased so far as production from home ores is concerned not only by the augmented first cost of materials but by increased transport charges, due not only to the increases in railway rates, but also to the longer hauls of materials in some districts. For example, in 1924 the Cleveland ironstone raised, which in 1913 amounted to 6,010,800 tons, totalled only 2,234,447 tons. The comparatively heavy cost of Cleveland ironstone and the transport charge (stated to be in the neighbourhood of 8s a ton) incurred in bringing ores from other fields, has undoubtedly been a heavy handicap to the Cleveland pig iron industry, and the output of the North-East Coast district declined from 3,869,000 tons in 1913 to 2,226,700 in 1924.

*Increase in average output of furnaces in blast.*

The average output per furnace in blast had grown by over 30 per cent. between 1913 and 1924, and new furnaces of large capacity (which are more economical in labour cost) have been built and brought into use even in the difficult years through which the industry has been passing. It may be assumed that, generally, it is the larger and more economical of the furnaces that are actually used, except where, for work of special quality, only small furnaces are necessary. It may well be that the cost per ton at the small furnaces is so much higher than at the larger ones that a large number of them may not be able to engage in production again except at a time of great demand and high prices. Of a total of 464 furnaces in existence in the United Kingdom at 31 December, 1925, no less than 106, among which there were doubtless many of the older furnaces, had been out of blast for five years or more. Compared with the furnaces of the principal iron-producing countries, the British furnaces are on an average small. For example, the average output in 1924 per furnace in blast was upwards of 110,000 tons in the U.S.A., upwards of 73,000 (metric) tons in Germany and Luxemburg and over 57,000 (metric) tons in France and Belgium.

*Variations in the cost of production in different districts*

One factor making for differences in the level of costs in the several districts is the great difference in the sizes of furnace employed. In 1924, when the average output per furnace in blast was 39,411 tons, the average of furnaces in South Wales and Monmouthshire was as high as 90,324 tons, that of the West Coast was 57,248 tons, of the North-East coast 52,047 tons, and of Lincolnshire 44,775 tons, while that of Staffordshire, Shropshire, Worcestershire and Warwickshire was 34,023 tons, of Parts of Lancashire and Yorkshire (including Sheffield) 32,600 tons, of Derby, Leicester, Notts and Northants 27,278 tons and of Scotland 19,984 tons.

It appears also that costs in the different districts are influenced by the conditions affecting the supply of ore. Reference has been made above to the position on the North-East Coast, and the figures for other districts appear to indicate some correspondence between increases in output of ore and of pig iron. Thus the Lincolnshire output of ore increased between 1913 and 1924 from 2,640,733 tons to 2,904,013 tons, that of Oxford and Rutland from 153,006 tons to 1,084,076 tons, and that of Leicestershire from 846,021 tons to 1,026,069 tons. On the other hand, in Scotland the output of coal measure ironstone, the only native supply, which once was plentiful, shrank from 591,561 tons in 1913 to 55,610 tons in 1924, while the Staffordshire

output of coal measure ironstone declined from 888,051 tons in 1913 to 418,529 tons in 1924.

The figures as regards pig iron production show that the Lincolnshire output increased from 450,000 tons in 1913 to 656,700 tons in 1924, and the Derbyshire, Leicestershire, Nottingham and Northants district fairly maintained its position, while the output of Scotland shrank from 1,369,200 tons to 667,800 tons, and that of the Staffordshire, Shropshire, Worcester and Warwick district from 850,700 tons to 482,000 tons.

That there is an appreciable difference between the cost of production of the several kinds of pig iron in different districts is borne out by the fact that while the total cost of production of basic pig iron by nine firms representative of each of the principal districts, as supplied to the Committee by the National Federation of Iron and Steel Manufacturers, was in 1924 increased by 58 per cent. over that of 1913, as shown in Table 4 on page 130, the total basic pig cost of Firm A in Table 6, on page 132, had increased by 67 per cent., while that of one leading firm, enjoying great advantages in production, was stated to have been only 45 per cent. above its 1913 level.

It will be seen from Table 6 that in the case of Firm B—Hematite Pig Iron, which is not comparable with the cases just mentioned, the total cost had increased by only 34 per cent. in spite of the employment of extra staff to sort, grade and store the pig iron for sale and the employment of five small furnaces instead of five small and one large furnace, which in 1913 produced much more pig iron per man employed than the small furnaces.

### Steel.

#### *Decline in ratio of output to capacity*

The most striking fact in regard to the situation of the steel industry as a whole in 1924 is that while its output of ingots and castings was greater than that of 1913, which itself was the highest in the pre-war period, its capacity had been so largely increased that it was working at only some 70 per cent. of its capacity. The employment available for the industry has been, moreover, unequally spread, owing partly to the varying circumstances of the markets to which the several steel-producing districts look for the disposal of their products, and also, as will be seen later, to the differing levels of the cost of production. The differences that have existed in the percentage of capacity worked are exemplified by the fact that while in total the eight firms referred to in Table 5, page 131, who produced roughly 20 per cent. of the total steel ingot production were working in 1924 at, roughly, 76 per cent. of their capacity, Firm A, in Table 6, was in 1924-25 working at only 53 per cent. of its ingot capacity.

The reduced ratio of output to capacity must clearly represent a heavy increase in the burden of overhead charges per ton produced.\* One firm, evidently suffering greatly from having its plant insufficiently occupied, is understood to have stated in 1925 that if only it could have its works fully occupied the price of sheet bars could be reduced by as much as 15s. a ton.

\* As regards the amount of capital charges under conditions of normal production, Mr F. W. Harbord, in his presidential address to the Iron and Steel Institute in May, 1927, stated that the cost in this country of a complete iron and steel plant designed for rolling rails and sections with all accessories was in 1910-12 about £6 10s to £7 per ton of finished rails or structural steel. Assuming an average figure of £6 15s. for 1912, and taking the low figure of 8 per cent. to cover both repairs and depreciation, he concluded that the charge for depreciation in 1912 was 10s 9d. per ton of output, or, including a return at the rate of 5 per cent. per annum on the capital invested in the plant, 17s 6d. per ton. Mr. Harbord added that in view of the large increase in costs of plant since 1912, the corresponding charge on a comparable plant would now be much higher than 17s 6d. per ton of output.

The increase in the total capacity of the steel industry was, unfortunately, mostly acquired during the war period when prices of construction were very high and plant had to be extended without regard to the ordinary conditions that govern capitalisation. Although the cost of the extensions was partly met from public funds, the depreciation charges on the plant remain a burden on the cost of production, and as a result of the capital expenditure involved the industry is, to some extent at least, over-capitalised. This condition contrasts with the situation in some of the competing Continental countries, where, as a result of currency inflation or other causes, the improvements that have been effected are stated to have been accomplished with comparatively little addition to capital charges.

*Increased cost of Materials.*

The cost of Materials is an important element (70 to 80 per cent.) in the cost of production of steel. Pig iron, one of the most important materials, has already been discussed, but in comparing the cost of production of steel in post-war and pre-war years, account must be taken not only of the higher cost of pig iron, but also of the diminished use of pig iron and increased use of scrap (which is cheaper than pig iron and, moreover, produced to a large extent—about one-half—in the steel makers' own works) in steel production. The figures are given on page 161, and it will be seen that the proportion of scrap to pig iron has increased from 1·3 in 1913 to about 1·1 in 1923 and 1924.

*Proportion of hot metal used*

While, as explained below, steel produced from hot metal is (according to evidence submitted to the Committee) not necessarily cheaper than that made from cold pig iron and scrap, the process represents an important improvement so far as fuel economy is concerned, and it has undergone a considerable expansion since 1913. In that year less than 28 per cent of the pig iron consumed in steel making was transferred to the steel works in a molten condition, while the corresponding proportion in 1924 was 45 per cent. Of the basic pig iron produced in 1924, roughly 60 per cent and, excluding the requirements of Scotland and of South Wales and Monmouth, which are largely obtained from other districts, a larger percentage was used in the molten state. A much smaller proportion of the acid steel manufactured which represented rather less than one-third of the total steel production in 1924, is made by the continuous hot process. In 1924 rather less than 20 per cent. of the total production of hematite pig iron was used in the molten state. In contrast, too, to basic pig iron, of which at least 1,692,500 tons out of a total production of 2,445,000 in 1924, or roughly 70 per cent. was used in the producers' own works, hematite pig iron is produced mainly for sale. Out of a total production of 2,342,600 tons only some 540,300, or some 22 per cent. was used in the producers' own works.

The Committee have been assured in evidence that, given plentiful supplies of scrap, steel produced from scrap and cold pig iron is able to compete in cost with steel produced from hot metal. On that basis, it is interesting to note, in connexion with the large proportion of the hematite pig iron which is used cold, that in 1924 on an average 8·82 cwts. of pig and 12·32 cwts. of scrap were used in the production of each ton of acid steel by the open hearth process as compared with 10·92 cwts. of pig and 9·98 cwts. of scrap per ton of basic steel.

*Variations in the cost of production in different districts*

The average cost of steel production may vary from one district to another owing to the different conditions affecting the supply of pig iron. As has been mentioned above there are appreciable differences in the average cost of producing pig iron in the several districts, and (subject always to the effect of using greater or smaller quantities of scrap) these differences must tend

to be reflected in the Materials costs of steel production. They also appear to be reflected in the output of the different districts, for the steel output on the North-East Coast (where, as already explained, the local ore is expensive and is supplemented by foreign ore and by home supplies on which heavy transport charges are incurred) had fallen between 1913 and 1924 by 300,000 tons, while Lincolnshire and the Midland districts, whose pig iron costs may be presumed to be comparatively light owing to the proximity of cheap ironstone, and also in the case of Lincolnshire because the local ore is self-fluxing, had been able to increase their steel output by nearly 700,000 tons.

Again, some districts are self-sufficient in regard to pig iron supplies, while others have to draw large quantities from outside their own borders. For example, whereas Scotland and South Wales and Monmouth produced between them in 1924 only 219,100 tons of basic pig they manufactured no less than 1,634,600 tons of basic steel. While a large quantity of scrap was doubtless used in steel manufacture, these figures suggest that a substantial quantity of basic pig was imported or obtained from other districts. Hence the Materials costs of basic steel productions in Scotland and the South Wales district must, in so far as their basic pig iron is obtained from other districts, by reason of the heavy transport charges involved, tend to be heavier than those of undertakings of corresponding size and efficiency in districts more favourably placed, while as they must use the pig iron cold their fuel costs must be presumed to be heavier than those of the greater part of basic steel manufacture, in which the pig is used in the molten state direct from the blast furnace with the advantage of the use of the waste blast furnace heat.

Again, as the North-East and the West Coast districts between them manufactured in 1924 1,394,600 tons of hematite pig, but only 338,100 tons of acid steel, it appears that, although some may have been used for foundry purposes, possibly 1,000,000 tons of pig was sent from those to other districts. The acid steel costs of those other districts are therefore affected by transport charges and by working from cold pig iron in the same way as are the costs of Scotland and of the South Wales and Monmouth district in regard to basic steel.

In considering the relative position of different districts, it should be remembered that the output of steel in Scotland, and on the North-East and West Coasts of England, was greatly affected by the depression in shipbuilding.

While the differences in the circumstances of the several districts suggest that the average level of costs varies from district to district, it would be incorrect to assume that because one district is better placed than another the costs of all manufacturers in it necessarily compare unfavourably with either the average cost or individual costs in the other district. Differences of location within a district have an important bearing on costs, as also have the age, size and efficiency of furnaces and rolling mills. The industry in this country is of longer standing than in competing countries, and some of its plant is smaller and less well-equipped with mechanical aids to labour and fuel economy devices than the more modern plant. For these reasons the cost of production is necessarily subject to appreciable variation as between works even in the same district.

### Engineering.

The great diversity of the engineering industry, which is exemplified by the specimen cost figures in Tables 10 to 13 of Appendix I (page 137, *et seq.*), forbids generalisations in regard to its costs, but some notes on costs in Locomotive Building and Agricultural Engineering are given below.

#### *Locomotive Building.*

As explained in greater detail in the Chapter relating to the Engineering Industry in the "Survey of Metal Industries," the locomotive building industry is divided into two distinct sections, the one carried on by

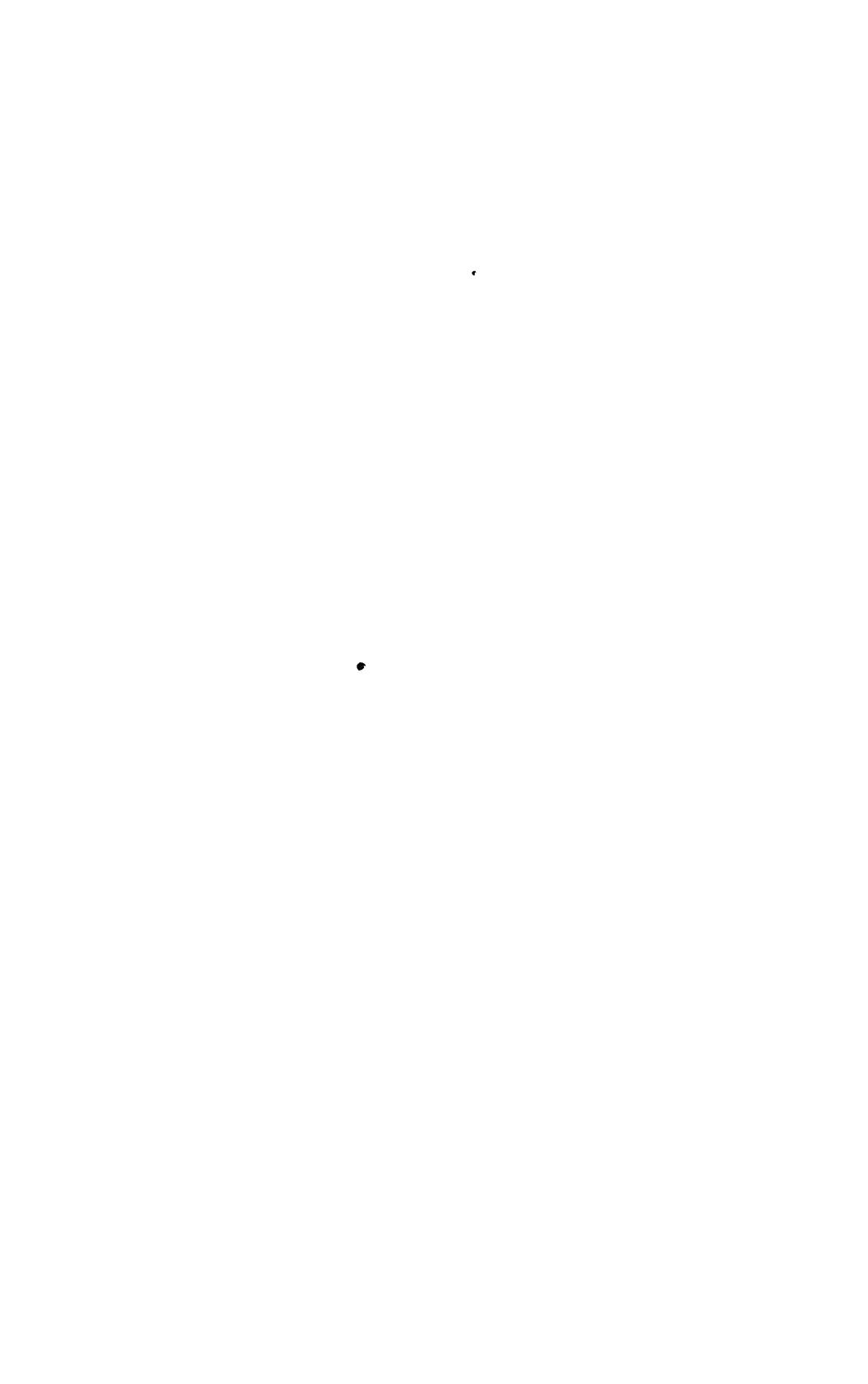
the railway companies within their own organisations, the other by independent manufacturers. As the railway companies build a substantial proportion of their own locomotives, the independent manufacturers are largely engaged upon export work, though a certain amount of the work resulting from the extensive programmes taken in hand by the larger railway companies since the war has been entrusted to independent manufacturers. It will be seen from the summarised cost figures in Table 11, on page 138, supplied by the Locomotive Manufacturers' Association, that in 1913, when the works appear to have been working to some 80 per cent. of their full capacity, Indirect Wages and Other Expenses accounted for 15 per cent. of the total cost. In 1925, when the works were working at, roughly, only 30 per cent. of their capacity, the corresponding charges amounted to 27 per cent. of the 1925 total cost, or 43 per cent. of the total cost in 1913. Had the works been occupied in 1925 to the same extent as in 1913, i.e. to the extent of 80 per cent. instead of 30 per cent., those charges would have been decidedly less per unit of production, and, on a conservative basis, it is probable that the saving in cost would have been between 5 and 10 per cent. of the total 1925 cost. The lack of a substantial home market contributes appreciably to the failure to realise that saving, and constitutes a serious handicap to the independent locomotive manufacturer in competing with manufacturers in other countries who have the benefit of their home markets. The railway companies claim to be able to produce locomotives much more cheaply than they can buy them, and in so far as their works are fully occupied with constructional work combined with repairs and maintenance, this should represent an appreciable advantage in lower overhead costs as compared with the under-employed works of the independent manufacturers. Any disparity between the costs of the independent locomotive manufacturer and those of the railway workshops is, no doubt, intensified by the circumstance that the former has to incur expenditure in canvassing for orders, and also by the fact that the railway companies are gradually standardising their production of locomotives and ordering from a certain limited number of types, while, owing partly to the differing requirements and the individual preferences of their customers throughout the world, the independent firms may manufacture as many as 24 different gauges and numerous different sizes of locomotives in one undertaking.

#### *Agricultural Engineering.*

It has been calculated by the Agricultural Engineers' Association that the output of the industry in 1923 was only about 45 per cent. of the 1913 output. The total cost figures of the 29 firms as set out on page 137 reflect in a marked degree the effect of the greatly reduced output. The Indirect Wages, Salaries and Other Expenses between them accounted for as much as 39 per cent. of the total cost in 1923, as compared with 26.6 per cent. in 1913. While the Materials Cost had increased in 1923 by 67 per cent. of the 1913 Material Cost, and the Direct Wages cost had increased by 87 per cent., the Indirect Wages cost had increased by 207 per cent., and the Other Expenses by 209 per cent. The information furnished does not permit of a close estimate of the extent to which the costs were increased by reason of the fall in output, but it may be conjectured that it lay between 5 and 10 per cent. of the total cost. It should be remembered, moreover, that the figures given are total cost figures of 29 firms, and inasmuch as the costs of the various firms must be presumed to have exhibited large variations it is probable that in some instances the costs of individual firms were swollen to an even greater extent by reason of the reduced production.

The industry appears, moreover, to incur heavy railway transport charges both on its materials and its products. It has been estimated that the railway charges from works to port of shipment amounted in 1924 to no less than

9.6 per cent. of the sale value of ploughs, while if the freight charges on materials to the works were included, the total inland transport charges amounted to 15 per cent. of the selling value. This figure represents only freight directly chargeable to the industry, and does not include the transport charges included in the cost of materials bought. The bulky and heavy nature of the industry's materials and products are such that transport costs must inevitably be heavy, but the location of manufacture, which appears to have grown up mainly in proximity to the principal home markets, certainly contributes to increase those costs by long railway hauls to the coast in the case of export, and would appear to represent a substantial handicap to the industry in its export trade.



## CHAPTER III.

### OVER-CAPITALISATION.

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## OVER-CAPITALISATION.

[*NOTE*—The Committee on Industry and Trade are indebted for this Memorandum to a Chartered Accountant of wide experience who prepared it for them at their request.]

The object of this memorandum is to examine some features of the phenomenon known as over-capitalisation in relation to industry or commerce. The subject is discussed with reference to public limited companies. It is convenient to adopt this course, for it is only in respect of such companies that particulars attract public interest when reductions of capital to remedy over-capitalisation are effected. Moreover, the capital of public limited companies (which amounted to a total of £3,180 millions on 31st December, 1926) represents a large and probably ever-increasing proportion of the total capital employed in British industry and trade. At the same time it is no doubt the case that private companies are not exempt from the possibility of over-capitalisation; the conclusions reached in this memorandum will probably be found to apply to them also.

Another limitation on the present discussion of over-capitalisation is that it relates primarily to the effects of this condition on the business of a company as a going concern (including the effects on costs, prices, and wages), and does not attempt to deal with the matter from the point of view of the investor or speculator.

Over-capitalisation attracts attention mainly on account of the belief that if the capital of an undertaking is excessive, this will lead to results prejudicial to the interests of the other parties concerned such as workpeople and consumers.\* In order to examine this question, it is necessary to consider the effect of over-capitalisation on costs of production and on prices, as well as to discuss more generally its effects on industry and trade. The events of the post-war years have drawn attention to the existence of over-capitalisation, since a considerable number of companies, many of them large and conspicuous in the public eye, have found it necessary to take steps for the reduction of their share capital or the lightening by other means (for example a moratorium in relation to debentures)

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\* For example, the following motion was put forward for discussion (though it was not actually discussed) in the House of Commons on 5th March, 1924.—

“ To call attention to the Over-Capitalisation of industry, and to move, That, in the opinion of this House, the present over-capitalisation of Industry has, by increasing the aggregate return to capital, added substantially to the cost of production and reduced the amount available for wages and is calculated to hinder a revival of trade, and this House urges the Government to institute an enquiry into the question.”

of the burden of their capital commitments. While the largest individual cases in which such action has been taken have occurred in the iron and steel and engineering industries, noteworthy examples can also be found in connexion with shipbuilding, cotton spinning, wool, rubber, glass, dyestuffs and food products, as well as in wholesale and retail trade.

To a large extent the inflation of capital in these and similar cases arose out of the conditions prevailing during and immediately after the war. For example, companies engaged in the iron and steel, engineering and shipbuilding industries, made large extensions of premises and plant during the war to meet the demands for munitions and instruments of war. The cost of these extensions, though financed to a considerable degree by Government grants or allowances, was heavy; and when peace came, further expenditure had to be incurred (at a period of soaring costs and prices) to transform factories from war-work to peace-time production. For all these purposes large increases in capital had to be made. Again, in these and other industries the expectation of a long spell of active trade and prosperity following the war led to the inception of enterprises planned on a corresponding scale and capitalised accordingly since they were carried out at high cost.

The result was that a number of enterprises found themselves facing the post-war period with extensive productive resources but also with extensive and expensive organisations, and debenture and loan obligations the cost of which could be met only if production remained profitable and was carried on on a large scale. When the slump of 1920-21 came, bringing with it reduced demand and diminished prices, it is not surprising that the burden of such charges was found too heavy. Similarly, the slump brought serious difficulties for wholesale and retail trading businesses which had locked up large amounts of working capital in manufactured stocks acquired at high cost.

In another class of case (including some instances where no extension of productive capacity was involved), amalgamations and combinations of companies were effected on a financial basis which, while it may have had some relation to the inflated values of works, plant, costs of materials and rates of wages prevailing before the slump, was found to involve over-capitalisation when the realities of the post-war situation came to be revealed.

In other cases (mainly cotton-spinning companies) where neither extension of productive capacity nor combination of undertakings was necessarily involved, capital was increased by means of financial operations carried out in the period of temporary prosperity and high prices which immediately followed the war. Mills were revalued on the basis of the high replacement costs then prevailing and on the basis of this revaluation, together with the high values of the stocks

of both raw material and of the manufactured stocks, the capitalisation was increased either by an issue of bonus shares, by a sale to a new company formed for the purpose, or by other means \*

*Meaning of over-capitalisation.*

In practice, two different tests of over-capitalisation are applied, according as the amount of "share and loan capital" is compared with (a) the value of the company's surplus assets, including as an asset a reasonable value of goodwill; (b) its profits over a period of years.† These two standards of comparison are generally employed at different periods in the history of a company. The first (a) is the standard by which over-capitalisation is measured when the company is formed, the second (b) is the standard by which over-capitalisation is measured during its life, and the first (a) is again the standard by which over-capitalisation is measured when it is being wound up.

The disregard with which shareholders and the Stock Exchange treat the possible value (either the value as a going concern or the value for sale) of surplus assets so long as a company is earning good profits and paying good dividends can hardly be exaggerated.

Under what circumstances does over-capitalisation arise if tested by the standard (a) above?

1. The owner of a business or a promoter, forms a company to acquire the business at a price which is excessive in relation to its assets and goodwill. If all or part of the purchase consideration payable to him is satisfied in fully paid shares he has freedom in making the price higher than if he were selling for cash. He postpones till a favourable opportunity the unloading of his shares
2. In an amalgamation in which the component businesses are being acquired for shares, relative values, not absolute values, are important. The substance is that each party to the amalgamation should receive his proper fraction of the whole. Although that is so shareholders are attracted by nominal values, and the tendency is to make the purchase consideration, and consequently the share capital, high. There is in such circumstances no inherent factor which binds the parties to reasonableness of price in relation to values

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\* The course of events in regard to cotton-spinning mills is very interesting from the point of view of this memorandum, and some particulars will be found in Appendix 3 to the Committee's Survey of the Cotton Industry.

† The word "over-capitalisation" is sometimes used with an entirely different meaning, viz. to describe a company of which the capital is in excess of its trading necessities in the sense that it has surplus cash invested outside the business because it cannot usefully be employed therein. This case is clearly not relevant to the present consideration.

3. A company constructs or acquires, say, a cotton mill, iron and steel works, or a ship during a boom period or period of high prices, and when the boom has passed, and prices have fallen, its capital is far in excess of the current value of its assets.
4. A company by a revaluation of its assets at boom prices creates an apparent reserve which is made the basis of an issue of bonus shares. Boom values subsequently fall and the capital remains at an inflated figure.
5. A company whose capital was originally not necessarily excessive in relation to the value of its assets may become over-capitalised (*a*) if through decline in demand its productive capacity (premises, plant and machinery, etc.) comes to exceed its need, or (*b*) if its assets are diminished by losses in trading, or its fixed assets depreciate in value over a period of years through failure to maintain out of income, obsolescence, etc.

Over-capitalisation tested by the standard (*b*), i.e. earnings, presents different features. What it generally means is that over a period of some years the company's earnings have been insufficient to pay reasonable dividends.

It will be seen that the results of applying the two standards of measurement do not always coincide. A company which would be described as over-capitalised under 1 or 2 above might by higher profits after its formation pay such dividends that on standard (*b*) no charge of over-capitalisation could be made. Conversely a company reasonably capitalised in relation to its assets may with a series of bad years' trading be subject to the charge of over-capitalisation under (*b*).

A striking case in a provincial city may be given. A company was formed, amalgamating a number of businesses at the end of a period of good profits, which businesses had an unusually large proportion of freehold and leasehold properties among their assets. The capital was fixed at a reasonable figure in relation to either assets or profits. Shortly after the company was formed the particular industry entered into a period of difficulty and only small or no dividends were paid on the ordinary shares. A charge of over-capitalisation was on everyone's lips. From time to time the company sold properties, and in every case the properties realised more than the original valuation. The value of the assets was still there. On standard (*b*) the company was over-capitalised, but on standard (*a*) it was not. A favourable turn in the class of business came, profits improved, reasonable dividends were paid, and no suggestion is ever made now that the company is or was over-capitalised.

The point to be emphasised is that over-capitalisation is not something quite definite, recognisable at any time, to which it is possible to attach a label and in respect of which a culprit is necessarily in the background, though there can be no doubt as to the existence of culprits in some cases or as to the evil and the losses which have resulted. In so far as over-capitalisation results from normal changes in value or in profits it is inherent in business and cannot be avoided. In so far as it results from the skill of men in exploiting the cupidity and ignorance of the public it merits opprobrium.

*Effect of over-capitalisation on costs, prices and sales.*

For the present purpose it is proposed to take the case of a company whose capital is greater than that of otherwise similar companies in the same industry and to consider whether the larger capitalisation affects costs, prices, or sales.

*Costs of production* are usually built up with the following main factors : (a) Materials, (b) wages, (c) percentage additions to cover factory and general overhead expenses. To the costs is added a percentage to provide profit, but this is not itself a cost and is, therefore, discussed separately below.

Of the three items in costs, the only one directly affected by the capitalisation of the company is that of overhead expenses, unless through over-capitalisation financial stringency reaches a degree that the company cannot buy on good terms when the cost of materials may be affected. This item includes depreciation, and if the items on the balance sheet which are being depreciated stand at inflated figures, the depreciation (and, therefore, the costs of production) will be greater than if they stood at reasonable figures.

It is understood that as a rule depreciation is not written off freehold premises and never off goodwill\*. Depreciation specially arises in plant and machinery, and the over-capitalisation of plant and machinery may be illustrated by cases where such assets (e.g. cotton-spinning machinery or ships) have been written up to boom values (or acquired at boom values) which, owing to a subsequent slump, fail to maintain themselves. If the amount set aside for depreciation continues to be based on the inflated values of the assets, it must represent a greater item in costs than it normally would. This factor of cost is, however, different from all other factors of cost in that it does not represent money going out of the business.

There are, of course, types of over-capitalised companies in which over-capitalisation of plant and machinery is insignificant compared with over-capitalisation of goodwill, or goodwill and freehold pre-

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\* Goodwill is frequently written off by an appropriation of profits, but not by way of depreciation.

mises taken together as they often are, and in such cases the direct effect of over-capitalisation on costs is insignificant. This may be illustrated by considering a company which takes over one or more businesses as going concerns. The purchase price is a lump figure, say, £500,000. The capital of the vendor company or companies was, say, £300,000. The extra £200,000 has to find a place in the new company's balance sheet. In other words, the £500,000 has to be allocated over the various assets purchased. Generally stocks, book debts, and other floating assets are taken at the same figures as in the balance sheet of the old company, plant and machinery are taken at or about the old figures and the balance of the £500,000 is described as goodwill and business premises, or it may be split between the two headings. Hence the increase in capitalisation in such a case would not directly affect costs of production to any substantial extent.

*Prices and Sales.* The only source from which a company can contrive to meet its costs and make a profit lies in the prices obtained for its commodities or services. Out of its profits a company must find the sums, if any, available for paying dividends on share capital and interest on loans and debentures (if any) as well as making additions to its general reserves. Undoubtedly directors would desire that the margin of profit covered by its selling prices should be sufficient to yield a reasonable dividend at the end of the year, and it is logical to suggest that if the capital is too high there is pressure on the directors to desire to make the percentage of profit higher than would be sufficient if the capital were lower. Before considering how far, if at all, this pressure can affect prices or sales, it is important to notice that the position will be different according as the capital (1) consists entirely of shares, (2) consists partly of debentures on which interest and possibly sinking fund are payable, (3) includes loans from banks or other sources.

It is true, of course, that bank overdrafts rarely form part of the methods of raising capital when a company is formed, and it may be held that they are not a form of over-capitalisation, although in many cases one of the results of that condition. Nevertheless, companies are frequently financed by bank overdrafts and on these interest has to be paid.

The system under which loans withdrawable on notice and bearing interest at a fixed rate form part of the permanent capitalisation of companies is not generally adopted. It was utilised some years ago by some of the London breweries, but it is now found chiefly in the cotton-spinning companies of Lancashire, where it has been in operation for a very long period and where a large proportion of the population, including great numbers of operatives, have been accustomed to invest their savings in this way. Although the system has the merit of giving to operatives and the people of the district generally a financial interest in the industry of the place, it

would not generally be regarded as sound finance under modern conditions to utilise loans repayable at short notice in the purchase of properties, plant and machinery, or so as to become absorbed in stocks and book debts.\* Nevertheless, a considerable volume of loans still exist and interest on them has to be paid.

In both these cases (bank overdrafts and loans from the public) the interest has to be paid not only before any dividends can be distributed to shareholders, but also whether profits are made or not ; and the same applies to payments of interest (and sinking fund) on debentures. Hence the object of the directors must be to secure that the company shall earn enough to enable them in the first place to pay all these standing charges and in the second to declare a dividend. If a company is capitalised solely in shares, there are not the same obligatory capital charges to meet, but it will still be the object of the directors to earn enough to pay a dividend to the shareholders.

The question for consideration here is whether in practice an individual company whose capitalisation is above the general level prevalent in the industry will (in an attempt to secure earnings sufficient to pay the charges on its relatively excessive capital) be able to increase its prices, and if not whether the directors will refrain from making sales that would otherwise be made.

On this aspect it may be worth thinking of businesses in two broad classes :—

1. Businesses which make tenders for work which is not stand-  
ardised and quoted for per unit, e.g. buildings, road-  
making contracts, machinery contracts, etc., etc.
2. Businesses which deal in goods sold per unit, e.g. woollen  
goods, cotton goods, flour, etc., etc.

In the first class the tender is probably based on estimated costs, to which a percentage of profit will be added by the directors or managers. It is believed that in the discussion of such tenders the amount necessary to pay a dividend is not as a rule a governing factor. The dominating view is, "How much can we get ?" "What are our competitors likely to do ?" The identity of the competitors who have been asked to quote and the knowledge directors have as to the fullness or emptiness of their competitors' order books are the factors which guide them to decide on the percentage.

Moreover, it should be remembered that costs of production cannot be regarded as definite and accurate knowledge. The percentage to cover overheads cannot be better than an estimate

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In the prolonged depression through which the industry has been passing, a number of cases have occurred where through the calling-up of unpaid share capital by mills requiring ready money, the shareholders in order to meet the call have been forced to call in their loans from other mills, thus throwing the finances of the latter into disturbance.

which is based on an assumption of the output for a year. Hence, if it is reflected that every addition to the volume of business will lead to a lowering of the percentage burden of overheads, it will be seen that, if the company is not working to its full capacity, there is always a pressure towards accepting any contract even if it will do no more than carry its own burden of overheads. There is, of course, the compensating pressure of unwillingness to cut prices, but to risk losing a contract because of the desire for an extra 1 per cent. or 2 per cent. profit on turnover to remunerate excessive capital would seem so obviously short-sighted that it cannot occur to any material extent.

The only obvious case in which interest would be likely to be the deciding factor in a manager's mind is one in which the contract is of such a character that further bank accommodation would be required. In such a case a manager would properly say that unless he could get a price which would cover his bare costs plus extra interest, he was better without the contract, because it would mean an actual cash loss besides contributing nothing to overheads.

In the second class of case, the case of businesses producing and selling more or less standardised goods at a unit price, the fixing of the selling price at any particular moment is not determined by the costs of production of such goods. Supply and demand and the higgling of the market determine prices on any particular day. This is almost wholly true of goods for sale in the home market, and it must be still more true of goods for export which must be sold in competition with goods produced in other countries under very different conditions. It would seem futile for a manufacturer to make the dividend he would like to pay on an inflated capital the deciding factor in quoting a price when he knows his competitor's price is based on conditions which make for much lower costs of production.

Broadly speaking, all similar units of the same commodity sell in the same market at the same time at the same price. It is no doubt true that over a long period the price cannot be less than the cost of production plus a profit. But what cost of production? Producers differ in ability and opportunity, some have better equipped and situated works, some have better relations with labour, some have more successful advertising and selling organisation; some are in this country with similar conditions as to standard of living, while competing producers in other countries may be working under lower conditions.

The competition of the efficient producer makes the trend of price towards the more efficient cost plus a profit. The less efficient makes a smaller profit, no profit, or a loss.

The record of liquidations and bankruptcies shows that the highest cost of production does not fix price. On page 52 of the

volume "Factors in Industrial and Commercial Efficiency," it is stated that in the Cotton Industry in 1922-23 thirty per cent of the output was produced at a loss. The table on page 462 of the same volume, and the seven tables of which it is a summary, show the diversity in results of businesses of the same class. Obviously the businesses have not been able to pass on to consumers the burden of their individual inefficiencies or handicaps.

In some cases over-capitalisation, far from restricting sales, drives companies to sell at cut prices. In the "Economic Journal" for March, 1927, is an article on "The Crisis in the Lancashire Cotton Industry," by Prof. Daniels and Mr. J. Jewkes. The last paragraph is:—

"Unfortunately about 40 per cent. of the spindles in the industry were involved in either recapitalisation or re-flootation, and this is a sufficiently large proportion to account for the widespread phenomenon of 'weak' selling. The probability is that many of these re-floated concerns must sell in order to meet fixed interest charges, and consequently create difficulties even for those concerns which still retain the designation of 'original' companies."

The over-capitalisation so far considered is a condition not affecting a whole industry, but a condition affecting certain businesses in the industry. All the forces of competition, therefore, must operate to prevent the burden of a return on inflated capital being passed on in price; and in daily work the impossibility must be so obvious that it is hard to believe that directors restrict sales because they cannot obtain a price which includes remuneration for capital.

The case will naturally be different where the forces of competition are wholly or partially inoperative. In the case of companies enjoying a monopoly or quasi-monopoly, it seems at first sight that prices can be fixed at whatever height may be necessary to yield the desired return on the capital, and hence that over-capitalisation will unduly increase prices. The matter is further discussed in Appendix II and the conclusion is reached that in such cases as electricity and gas companies, the conditions actually prevailing in this country are such as to preclude any serious abuse of monopoly power in fixing excessive prices.

#### *Effect of over-capitalisation on wages.*

It is sometimes suggested that a company whose capital charges and costs are by reason of over-capitalisation greater than those of its competitors will aim at economising in other directions, e.g. in respect of its labour costs. Since, however, rates of wages are now generally fixed for an industry as a whole by negotiations between employers' associations and trade unions, it is very doubtful how far any desire of directors of isolated businesses with an inflated capital

to reduce wages in order to increase the profits available for dividend could be made effective. At the same time, if, through increasing the share capital of a company, the rate of dividend paid has been reduced, the fact that the rate of dividend is not high may be used as an argument in wage discussions. It is, of course, the case that the retention of surplus earnings in a business as distinct from utilising them to pay higher wages (assuming the latter course would in fact diminish the amount of the surplus) has the effect of increasing the scale of the business and, therefore, the amount of employment which it can offer. It would, however, only tend to increase the existing (and generally unmerited) suspicion of bonus share issues to which reference is made in Appendix I, if attempts were made to plead as an argument for lower (or against higher) wages rates of dividend which have been reduced through distribution of reserves in the form of bonus shares. All cause of suspicion would be removed if in such cases the true facts were made available for the guidance of the negotiators.\*

*General evil effects of over-capitalisation.*

When owing to over-capitalisation a company finds that its profits are inadequate to pay a reasonable dividend on its shares, the immediate danger which arises is the temptation to directors to make the apparent profits as high as possible by neglecting to put aside sufficient reserves, making inadequate allowance for depreciation, etc., the object being to enable them to declare some dividend or a higher dividend than is in fact prudent.

To distribute profits "up to the hilt," as it is expressed, almost inevitably leads towards diminution of working capital, because in nearly every business additions to capital expenditure must be made from time to time, e.g. additional buildings, new machines, etc. If all profits are distributed and cash is needed for new capital expenditure, the working capital is correspondingly reduced. A bad year's trading may result in a loss. There are no savings to draw on, and the working capital is further reduced. If that process continues, financial stringency will result, a bank overdraft will be raised, interest will have to be paid whether profits are made or not, and an unhealthy condition may become chronic.

The case is aggravated if the company has interest to pay on loans or debentures, with possibly sinking fund payments in addition, for such payments must be made whether profits are earned or not.

<sup>1</sup> Just as in the case of wage negotiations, so in price negotiations (particularly where separate bodies of consumers are dealing with a combination), rates of dividend may be quoted as an argument against price reductions in cases where dividends have been reduced in the manner explained above. The matter is, of course, complicated (as regards both wages and prices) by the fact that although the original capital may be receiving a very high return, the ownership of that capital may have largely changed, and the existing shareholders may have bought their holdings at a price based on the actual percentage rates of dividend declared on the increased capital.

Any excess of interest and sinking funds over profits comes out of working capital and the greater the degree of over-capitalisation, the greater is the risk of this contingency becoming real. If the circumstances are such that debentures have been given as collateral security for a bank overdraft, the risk is increased, as the principal amount may be required at any time.

The results of conditions as described above show themselves first on the minds and policy of the men who run the business. They have not freedom in making new departures, in taking risks, in undertaking business which will absorb further working capital; they have not the confident self-reliance which success brings. Moreover, a company which is financially strong can mitigate to some extent the effects of a temporary falling-off in demand by such expedients as making for stock and by taking the opportunity to overhaul its plant. It will also be in a position to make drastic cuts in selling prices, even where this involves an immediate loss, in order to stimulate demand and thus ultimately to spread its overhead costs over a larger output. A weak company may lack the resources to do any of these things. It cannot face an immediate loss in the expectation of a greater ultimate gain. Consequently its power of resistance and recuperative capacity are both diminished.

It seems clear that companies which make savings out of income and so accumulate reserves for investment in productive enterprise perform a valuable social service. There can be no doubt that trade revival is vitally dependent on national savings, and that the diminution in savings during post-war as compared with pre-war years is greatly hindering the trade recovery of this country. There is probably no channel which conducts savings to productive use so directly as the reserves accumulated by successful manufacturing and trading enterprises, and it is not the least evil result of over-capitalisation that it tends to diminish the building up of reserves and so reduces the power of the company to expand its business. Any check to expansion not only affects the company itself, but is very prejudicial from the point of view of labour, as it reduces (or prevents an increase in) the field of employment.

Widespread over-capitalisation throughout a particular industry may have prejudicial results of various kinds. If it leads to low dividends being paid, this may give colour to the suggestion that the industry is inefficient and unprogressive.

#### *Considerations leading to reductions of capital.*

If it be questioned whether the disadvantages of over-capitalisation already set out above are an adequate explanation of the adoption by companies of schemes for the reduction of their capital, it should be remembered that accountants and directors who recommend such schemes are looking at the position from a somewhat different angle from that of this memorandum.

Among the conditions preceding such schemes are usually mismanagement or unsuccessful management, inadequate profits in relation to capital, and over-valued assets both fixed and floating. There is a need of new men and possibly of additional available cash in the concern. If the fixed assets are written down a loss will be shown on the balance sheet. Legally, such a loss appearing on the right-hand side of a balance sheet need not interfere with the payment of dividends, but in practice a company would not (unless under quite unusual circumstances) allow such an item to continue. It can only be got rid of in two ways, viz. by reducing the capital, or by withholding from paying dividends out of future profits until the loss is recouped.

If the floating assets are over-valued they must be written down, and that loss can only be got rid of in the same ways.

Therefore, the desire to clear the position so that the company may have a new start and future profits may be available for dividend makes a reduction of capital advisable. New men will not be disposed to come in unless the position is so cleared.

Next, although a reduction of capital provides no additional available cash, it may make possible, or more easy, the raising of new capital. Debenture stock can be more easily placed by a company which is paying dividends than by a company which is not. The reduction is even more important if an issue of preference shares is in contemplation. If an ordinary share issue were contemplated, it could not be made at par, or subject to a reasonable discount, if dividends were not being paid and a deficiency were shown on the balance sheet.

In addition there are the psychological effects which have been referred to. It is good for business, and for the men who are in it, to have the reputation of success; and as a general rule the only measure applied by the public to success in a company is the measure of profits and dividends.

## Appendix I.

### *Accounts of limited companies.*

Every limited company must prepare a balance sheet at least once a year which is as a rule issued to the shareholders, if a public company, and laid on the table at a general meeting, if a private company. A statement in the form of a balance sheet is filed at Somerset House by every public company.

The company has always a profit and loss account ; and what is called a profit and loss account is frequently published with the balance sheet. The profit and loss accounts so published are usually limited to giving under a few headings information which is so summarised as to be of little, if any, value. They cannot in practice be made completely informative, and, so far as profits are concerned, the balance sheet shows the undistributed profits linked up with the similar item on the preceding balance sheet. Even the balance sheet must be summarised. In a company with departments, branches and subsidiary companies the detailed balance sheet is so voluminous and complicated as to be quite unsuitable for publication and unintelligible except to skilled persons.\*

Notwithstanding the qualifications to which they are subject, published balance sheets are of great value ; but they neither can nor do tell everything, and there has grown up a mystery about and suspicion of company's accounts which has led to confusion of thought and to criticism which is not as a general rule merited.

The vast majority of balance sheets are honest statements. They do not purport to show the realisable value or present value as a going concern of fixed assets. (See next section below.) They do purport to show stocks at cost or market price, whichever is lower, sundry debtors after making reasonable provision for bad and doubtful debts ; cash in hand and at bank at actual figures, and, all important, they purport to show all liabilities, definite, accrued or contingent. Finally they show certain reserves and undistributed profits out of which dividends may be paid.†

Practically every balance sheet is audited. The auditor's staff are largely occupied in the detailed checking and vouching of the items which ultimately find their place in the profit and loss account, but in the mind of the auditor personally it is the balance sheet which is the dominating consideration, and the questions for him are

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\* This statement often applies with particular force to the balance sheets of "holding" companies.

† As regards "Secret" Reserves, *see* below, pp. 188-9.

whether the floating assets have been reasonably valued so far as his knowledge enables him to judge, and whether all liabilities have been included. If not, the profits may have been overstated, too high dividends may be paid in consequence, and if the company goes into liquidation he as well as the directors may become liable to refund dividends so paid on the ground that they have been paid out of capital.\* Thus the auditor tends always to advocate a prudent policy in arriving at profits and paying dividends, a policy which leads to the building up of savings and reserves as described below.

*Valuation of assets in balance sheets.*

In cases where properties bought by companies have proved of less value than had been paid for them, decisions of the Court have established that losses or depreciation in value of fixed assets need not be made good out of profits before dividends can be paid, but that all floating assets, in other words working capital, must be taken at not more than actual values at any particular date before arriving at profits available for dividend.

It would follow that in the balance sheet of any company fixed assets were likely to be maintained at cost price ; but in practice leasehold properties, plant and machinery are usually shown less depreciation. Still, the amounts at which fixed assets appear in a balance sheet ought not to be regarded as necessarily any measure of their value at the date of such balance sheet. For many reasons it cannot be otherwise.

If every company were formed by a purchase for cash at arm's length with the vendor, there would be ground for thinking that at the beginning it had assets of a then real value equal to its capital, and save for depreciation in values or losses on trading that value would continue. Under such circumstances a purchase by a company does not differ from a purchase by a private trader. It may prove wise or unwise, and in so far as depreciation in value arises from causes which lay in the future when the company was formed, a private trader would be in an identical position.

In practice, however, various circumstances may bring it about that the value of a company's assets may not correspond with the amount of its capital. For example :—

- 1 Companies may issue shares as fully paid up in consideration for assets transferred, and no evidence of any kind is required as to the real value of the assets

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\* The Companies Acts provide that shareholders may only draw money out of the business in the shape of dividends ; and that dividends may only be paid out of profits.

2. The same result can be arrived at in a one-man company by a sale to the company for cash and the vendor paying to the company for shares the same, or approximately the same, amount
3. A company may be formed with a bona fide purchase of a business at arm's length at a time of boom prices, and at a later date when a slump has come the value of the assets acquired will have fallen.

Such circumstances have been the occasion of much of the watered capital\* and over-capitalisation of companies.

It may here be remarked that, while the Companies Acts require that capital once created should not be reduced without the consent of the Court, there is no corresponding limitation on increases of capital. All that is necessary to increase capital is to pass a special resolution and to pay duties. Originally the position as to reduction of capital was still more restricted than it now is, for under the 1862 Act there was no provision for the reduction of capital. Under the 1867 Act it was held that only uncalled capital could be cancelled, and it was only under the 1877 Act that paid-up capital could be reduced. Under both Acts the sanction of the Court was required. As explained above, the Courts have in the past decided that a company is under no obligation to make good capital losses out of profits before paying a dividend. In other words, when the values of its fixed assets fall, a company is not obliged to write down such assets out of profits, or, in the alternative, to reduce its capital; and should it decide on the latter course, it is faced with the troublesome and expensive process of going to court. On the other hand, if the value of a company's fixed assets rises, it can without consent write up their valuation almost as it chooses. The surplus thus accruing can then be treated as if it were profit, and may be made the basis for an issue of bonus shares.

The preceding memorandum contains a discussion of the circumstances in which reductions are effected in the issued capital of companies. Some further explanation seems desirable as to the formation of reserves by companies and the issue of bonus shares.

*Formation of reserves and issue of bonus shares.*

Possibly a comparison of the accounts of a private trader with the accounts of a limited Company doing similar business may clarify the subject.

A private trader begins business with a capital of £40,000. He buys a freehold works building for £10,000, plant and machinery for

£15,000, and has £15,000 as working capital. He carries on business for five years, making on an average a net profit of £3,200 per annum, giving a total of £16,000. He lives on £1,200 a year and saves £10,000 in the five years.

His balance sheet at the end of the fifth year will be somewhat as follows :—

<i>Capital and Liabilities.</i>			<i>Assets.</i>		
	£			£	
Sundry Creditors	12,000		Works Building at cost ..	..	10,000
Capital .. ..	50,000		Plant and Machinery		
			Original cost ..	£15,000	
			Additions ..	6,000	
				£21,000	
			<i>Less Depreciation</i>	5,625	15,375
			Stock .. .. ..	20,000	
			Book Debts .. .. ..	15,425	
			Cash in Bank .. .. ..	1,200	
	£62,000			£62,000	

The example assumes a reasonably successful business and a prudent man who has lived within his income. His savings have as they accumulated been used at once in productive industry, and at the end of the five years (subject to the qualification whether the works building, plant and machinery are worth the £25,375 at which they stand in the balance sheet) he is £10,000 better off than at the beginning, and in the future may anticipate receiving a return out of the business on the £10,000 so accumulated, as well as on the original capital.

Instead of commencing a business for himself with £40,000 of his own capital, the man might have formed a company with 40,000 shares of £1 each, which are taken up by himself and any number of other people. It may be assumed, to make a comparison easy, that the company does just sufficiently better than the private trader to cover directors' remuneration, that the net profits for five years are identical with the results above shown, and that the directors show the same prudence which the private trader showed and pay dividends of an average of £1,200 per annum, the same amount that the private trader drew.

The company's balance sheet at the end of the fifth year would be somewhat as follows :—

<i>Capital and Liabilities</i>		<i>Assets.</i>	
Capital (authorised and issued) :—	£	Works Building at cost	£
40,000 shares of £1 each	.. 40,000	Plant and Machinery	
Sundry Creditors	.. 12,000	Original cost	£15,000
		Additions..	.. 6,000
			<hr/>
			21,000
Reserve	.. .. 8,000	Less Depreciation	5,625 15,375
			<hr/>

Profit and Loss Account :—

Balance	.. .. 2,000	Stock..	.. .. 20,000
		Book Debts ..	.. .. 15,425
		Cash in Bank	.. .. 1,200
			<hr/>
	<hr/>		£62,000
			<hr/>

The assets are identical with those in the private trader's balance sheets, but on the other side there is a difference as follows :—

<i>Private Trader's.</i>		<i>Company's.</i>	
Capital	.. .. 50,000	Capital (issued shares)	£ 40,000
		Reserve .. ..	.. 8,000
		Undistributed balance of	
		Profit and Loss Account	2,000
	<hr/>		<hr/>
	£50,000		£50,000
			<hr/>

The aggregate of the company's share capital, reserve and undistributed profits is £50,000, the same as the private trader's capital ; and if the company at that point determined to increase its share capital to £50,000 by the issue of 10,000 bonus shares of £1 each, its balance sheet would become identical with that of the private trader. The company has shown the same prudence as the private trader in living within its income, the shareholders have acquiesced in that prudence and have rendered the same social service to the community in saving £10,000 and using it in productive industry, where it is already earning a return before the bonus shares are issued.

The two cases appear closely analogous, and just as in the one case the individual private trader may anticipate receiving a return on his increased capital, so the several shareholders in the company may anticipate increased remuneration for the capital they invested

or withheld from withdrawing, whether this takes the form of dividends at a higher rate on the original amount, or is spread over a larger (nominal) share capital by the issue of bonus shares. In the latter case, however, the nominal value of each investor's holding is definitely increased, and has the appearance of a gift, and this seems to be largely the origin of the opprobrium which issues of bonus shares attract.\*

This attitude may possibly arise from too much weight being attached to the nominal money value of the shares. If the private trader had had three partners each with a share in the business equal to his own, the share of any one would have been described as one-fourth of the business, but a man who held 10,000 shares in the company would be described as having £10,000 in it. The circumstances that one-fourth of the private business is worth more at the end of five years than it was at the beginning does not shock the mind, but a statement that £10,000 of shares have grown to £12,500 of shares seems to do so. It is possible that many difficulties would disappear if shares were thought of as fractions of the whole, and it is certainly more accurate to think of ordinary shares in this way. It is true that the stated number of £s were put in at the beginning, but the £s at once ceased to exist, and instead of the £s the company had buildings, works, stocks, etc. The £ may and does change its value from time to time, and the buildings, works, stocks, etc., vary in value. It is, therefore, unsound in this aspect to think of a shareholder having £s in a company; what he really has is a proportion of the "surplus assets" at any date, and a right to a proportion of the profits.

The foregoing example sets out truly typical facts on which the majority of bonus share issues are made; but the foregoing memorandum shows that bonus shares have been issued under different sets of circumstances than those described above and have in some cases led to the evils of over-capitalisation.

As an example, reference may be made to cases where a company has its fixed assets revalued and out of the profit or surplus on paper so shown it issues bonus shares. This course was adopted by a number of companies in the period of inflation immediately following the war, and so far as is known its legal validity has never been tested. It is probably sound if the revaluation represents a permanent and certain higher value in normal times and conditions. For example, if a site in the centre of London stood in the books of

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\* It is, of course, the case that if a company refrains from distributing its reserves and by successfully using them in its business is enabled to pay high rates of dividend, the market value of its shares will appreciate so that a holder who sells will receive a "bonus" on this account. It may be remarked, however, that the market value of £200 of shares yielding, say 8 per cent, is likely to exceed that of £100 of shares in a similar company yielding 16 per cent.

a company at the cost at which it was acquired 100 years ago, there seems nothing unsound or unfair in the suggestion that the site should be written up in value and bonus shares issued. That is, however, very different from writing up factory buildings, plant and machinery to the values of 1919 and 1920, and issuing bonus shares in respect of the difference ; and most bonus share issues of this class should probably be regarded as being of the nature of " water " (see below).

It is clear that, broadly speaking, the transaction of creating bonus shares merely represents the process of bringing the issued capital into relation with the value of the company's assets. It seems certain that the savings out of income which are the necessary precedent to such bonus share issues are to be commended. The directors who recommend such savings and the shareholders who acquiesce in them perform the same social service as the man who lives within his income and makes savings which he invests in industry. It must be unsound to suggest that if these savings are withdrawn as dividends and re-invested they are entitled to reward, but if permanently fixed in the business in which they arise they are not to be rewarded.

Of course, there are practical limits which prudence places on the issue of bonus shares in respect of undistributed profits, and each case has to be considered in the light of its own special circumstances.

There can be no doubt as to the advantages accruing to a company through its possession of ample reserves, and there may be cases in which the capitalisation of savings is the only method by which they can be retained in the undertaking ; for if they are not capitalised, the shareholders who prefer the cash may insist on their distribution.

#### *Bonus debentures.*

There have been some cases in which bonus debentures have been issued. The considerations applicable to them are similar to those affecting bonus shares, with one important difference, viz., the debentures can be repaid by the company, whereas the shares cannot. The motive behind such issues of bonus debentures has in some cases been the avoidance of super tax, and the Courts, in a case which went to the House of Lords, have held that super tax was not payable by the recipients.

#### *Secret reserves.*

The example given above of the formation of reserves (represented by material assets) as the result of accumulating undistributed profits assumes that the reserves are shown in the balance sheet. In many cases the reserves, while equally real and similarly represented by assets, may not be so shown, but may exist as secret or

undisclosed reserves. There is nothing which is necessarily reprehensible about such reserves. In fact it is common knowledge that in nearly every well-directed business of any size there are some secret reserves which do not appear on the surface.

Secret reserves in so far as balance sheets are concerned usually take three forms :—

- (a) They may take the form of amounts written off assets so as to reduce the figures at which they appear in the balance sheet to less than their true values at the date of the balance sheet.
- (b) They may in the ledger of the company be represented by reserve accounts which in the balance sheet are deducted from the amounts appearing in the company's ledger in respect of assets, so arriving at the same result as (a) so far as the published balance sheet is concerned.
- (c) They may in the ledger of the company appear as reserve accounts which in the published balance sheet are included under the item "Sundry Creditors and Credit Balances."

In all these cases they are profits earned, represented by assets, on which profits income tax has been paid, but which have not been included in the published profits of the company. There are other possible forms of secret reserves, e.g. :—

- (d) A company values its stock at cost. At the date of the balance sheet market prices have risen and the value of the stock is higher than cost. The difference is in a sense a secret reserve.
- (e) A similar position may arise in respect of investments. In some companies depreciation in value of individual investments is written off as a loss, but appreciations in value of other investments are not taken credit for in the profit and loss account until they are sold and the profit realised.
- (f) A subsidiary company may make profits but declare no dividends, or less dividends than its profits permit. Its assets increase, but the original investment may remain at cost in the parent company's balance sheet.
- (g) Sometimes an asset—say a holding in a subsidiary company which is not a success—is written down out of profits to a low figure. The business of the subsidiary company improves and becomes profitable. The low figure may be allowed to remain in the parent company's balance sheet.

*Meaning of "watered capital."*

The term "watered capital" is sometimes used as implying over-capitalisation, but the expression seems to be more colloquial than scientific. For example, a company's capital is sometimes said to have been "watered" by the issue of bonus shares, but, as explained

above, the majority of bonus share issues are based on the existence of reserves represented by profit-earning assets. Again, if a promoter buys a business for £x and sells it to a company for £y, the excess of y over x may be described as "water." It may be that the loading is not more than a reasonable amount to cover expenses of issue, underwriting and a reasonable remuneration for risk ; and if the promoter bought cheap it may even be that the price paid by the company is not in excess of the real value. Still, in that case the capital may be described as "watered," although there has in fact been no over-capitalisation. The more frequent case to which the expression is applied is, of course, the case in which the loading is excessive. The difference is one of degree.

As another example, after a company has been formed its capital can be "watered" in the same sense by a subsequent purchase of other property on which an intermediary has taken a profit. The purchase price might be satisfied by fully paid shares issued out of the original authorised share capital if sufficient, or if not by increasing the authorised capital, or (less probably) the price might be paid in cash. Again, the practical question is whether the price paid by the company is excessive.

In all three examples it will be clear that "watering" in the colloquial sense may or may not involve over-capitalisation, and therefore does not require separate discussion.

## Appendix II.

### SPECIAL CONSIDERATIONS APPLYING TO MONOPOLIES.

*Unconditional monopolies* were as a rule the product of authority. In early times they were common; to-day they hardly exist. Sometimes the ownership of a patent or say a mineral spring of medicinal value creates an approach to an unconditional monopoly. Under such circumstances, how are selling prices fixed? The monopolist may make the price what he chooses, but the higher he makes the profit (and therefore the price), the lower will be the number of units sold. His total profit is the number of units multiplied by the profit per unit. His aim must therefore be to fix the price at the level which will make the product of the two factors greatest. If he has succeeded in doing so the capitalisation of his Company must be irrelevant.

*Conditional monopolies*.—Such monopolies as are now created are partial monopolies for public services such as railways, gas, electrical and water undertakings. They are all granted on conditions. The conditions are laid down in Special Acts of Parliament or in Provisional or other Orders and are in effect the result of a bargain, Parliament's desire being to grant just such privileges as will induce Capital to take the risks of the enterprise, and give efficient service.

Considering such enterprises in relation to the subject of over-capitalisation, it is true to say that their prices are fixed with the view of yielding a return on their capital, and it would appear to follow that if they are over-capitalised the prices will be thereby increased. That, however, is an inadequate consideration of the subject.

#### Electrical Undertakings.

Among the most important of the quasi-monopolies are electrical undertakings. For the purpose of this consideration they fall into two classes:—

1. Companies operating authorised undertakings under Provisional or Special Orders and authorised to supply electricity for all purposes within limited areas.
2. Power Companies with wider areas working under Special Acts, with limited power of supply over wider areas.

#### Authorised electrical undertakings.

*Authorised undertakings* have from the beginning been subject to certain restrictions:—

1. They are subject to purchase by the Local Authorities. Under the Act of 1888, Local Authorities could take them over at the end of 42 years (the Act of 1882 specified 21 years) or at intervals of 10 years thereafter on payment of the value of the then existing physical assets without addition for goodwill. That basis had no reference to what capital expenditure had in fact been made.

When Provisional Orders were under discussion, local authorities generally or frequently desired to insert special purchase terms operative before the expiry of the specified period of years. Such terms generally were —

- (a) on a going concern basis, i.e. a capitalisation of profits.
- (b) at the amount of the capital actually expended, plus a small percentage.

All such special purchase terms had to be approved by the Board of Trade, or at later dates by the Electricity Commissioners.

2. The persons or company to whom the Provisional Order was granted had no power of sale except to the local authority.

3. The accounts of the undertaking under each Provisional Order had to be in a prescribed form and kept separate, and were examined annually by Board of Trade auditors, who, among other things, had to examine every amount added to capital expenditure.
4. All such Provisional Orders contained a Schedule of Maximum Selling Prices.
- 5 Any local authority which thinks rates of charge are too high can apply to the Ministry of Transport for a reduction in the scheduled maximum selling prices.

With such conditions at their foundation it is obvious that sales and re-sales and amalgamations, which are the usual procedure through which over-capitalisation is brought about in limited companies, are unlikely to take place in relation to authorised electrical undertakings.

Further, abnormally high profits in a boom period, which afford the usual opportunity for promotions and over-capitalisation, do not exist to the same degree, if at all, in public utility undertakings.

If over-capitalisation occurs in authorised electrical undertakings it must be in the cost of the plant and equipment. Outside of London it is probably true to say that the great bulk of the authorised electrical undertakings owned by companies (as distinct from municipalities) are the smaller undertakings. Groups of such authorised undertakings are sometimes owned by one company which employs a technical staff, buys plant, machinery and stores in bulk and re-sells to the authorised undertaking. If the profit put on by such a company does not exceed the benefit resulting from the use of a central technical staff and central buying, there is no resulting over-capitalisation. Such a company affords a means of raising capital which would not be open to the authorised undertaking as an isolated unit.

Let it be assumed, however, that the safeguards have been ineffective and authorised undertakings have been over-capitalised. In such a case, can directors make effective the desire to increase the selling prices to yield increased profits and provide dividends on the inflated capital ?

If the accounts of some of the smaller authorised undertakings be examined from their beginnings, their records will be found to be very similar—early years of development showing no profit, followed by years of small profit insufficient to cover depreciation, followed in the growth of the industry by years of slightly better profits. That was a not uncommon position up to the war. Then came a period of high costs and bad results before temporary increases in maximum prices were granted. Then came a better period in which the higher prices and the increased volume of output gave good profits. Under such circumstances, local authorities have applied through the Electricity Commissioners to the Minister of Transport to force a reduction in prices. The Electricity Commission is a body familiar with working costs and selling prices throughout the country, it includes engineers of great experience, and it seems most unlikely that any company seeking to establish selling prices to meet dividends on an inflated capital would have any appreciable chance of success.

In view of all the circumstances it appears that the possibility of over-capitalisation affecting prices in authorised electrical undertakings is not a real danger in practice.

#### *Electric Power Companies.*

In so far as power companies for supply over wide areas are concerned the facts are somewhat different. They work under special acts which provide for sliding scales of prices in relation to dividends and limit dividends to 8 per cent. They are not subject to compulsory purchase as the authorised undertakings are. Their accounts are subject to official audit. In the early days of the power companies, the business was in an experimental stage and

it was difficult to attract capital. Manufacturers were sometimes tempted to take payment for boilers, machinery, cables, etc., partly in shares, and no doubt the nominal amount of such shares was higher than the amount which would have been accepted in cash. In some cases there was probably also injudicious expenditure. To facilitate raising capital there were sometimes finance companies or construction companies formed and they, it must be assumed, had to cover expenses and a profit. It is difficult to measure what such loading represented as a proportion to total capital expenditure. It is undoubtedly that some power companies had very difficult crises, some wrote down their capital, and some have not to this day paid a dividend on ordinary shares.

So far as selling prices for power are concerned, they are controlled by competition to a degree to which the sale of electricity for lighting is not subject. The convenience of electric light in a private house is such that whether the price is 6d. or 10d. a unit may not affect the consumption very much, but in selling electricity for power, the difference between 1½d. and 2d. may make all the difference between doing the business and not doing it. The power companies had to make their business by displacing steam or solid fuel, and they have to maintain it in competition with both and with the installation of private generating sets.

There is no control over the method of issuing capital in the case of authorised distribution companies or power companies. This may result in a form of over-capitalisation in two ways. First, it is possible for these companies to issue stock or shares to their shareholders at par or at a premium less than the premium which could have been obtained by an issue on the open market. The resulting difference between the cash actually received by the company from the issue and the amount which might have been obtained by a public issue may be regarded as virtually a bonus to the shareholders. In such cases, the capital of the company on which dividends have to be paid is clearly larger than it would have been if the premiums which could have been obtained for the issue had been secured and had been applied to capital expenditure. Secondly, a company may obtain the whole of the capital required by the issue of ordinary shares, instead of by loans or debenture stock, preference and ordinary shares in reasonable proportions, with the result that the necessary remuneration for capital is increased to the disadvantage of the consumers whose prices have to be based on the higher figure. This possibility has been guarded against in the recent settlement with the London companies, who are required by the Acts to satisfy the Electricity Commission that new capital is being raised in the most advantageous form and on the best terms obtainable.

### Gas Undertakings.

Gas undertakings are not subject to purchase by local authorities as electrical undertakings are, but are controlled by legislation whereby (a) share capital, (b) borrowing powers, (c) rates of dividend, (d) price of gas, and (e) amounts which may be set aside in reserve and other funds are regulated.

When a company is first given statutory power to supply gas, the maximum amount which may be raised by the issue of share capital is stated in the Act or Special Order, and borrowing powers not exceeding one-half of the share capital are authorised. Having regard to this limitation, the company is, in theory, required to maintain its undertaking out of the revenue of each year, and the setting aside of sums from revenue as depreciation on fixed plant is not recognised.

When the company requires further capital, the necessity for it has to be proved to Parliament or the Board of Trade, and it is open to local authorities to object to the amount proposed and to bring forward complaints as to non-compliance by the company with its Acts and Orders. An amount of

additional share capital and borrowing powers sufficient to meet the requirements of the company for from 10 to 15 years is generally allowed. The new capital has to be issued by auction or tender under conditions which ensure due publicity, but in a few cases issue by subscription, subject to Board of Trade control, has been allowed.

The manner of regulating the amounts which may be set aside in reserve and other funds differs according as the company's dividends and prices are regulated by maximum rates or by a sliding scale (*see below*).

Where the maximum dividend system is in force, any profits in excess of those required to pay the maximum rates of dividend must be transferred to the reserve fund (up to a maximum of one-tenth of the nominal capital of the company) and can then be used only to meet a deficiency in profits, or to meet "any extraordinary claim or demand" which may arise against the company.

Where the sliding scale system is in force the only reserve fund allowed is for equalisation of dividends, and this can be built up only out of profits which might otherwise have been paid away as dividend under the sliding scale provision. At the same time a limit is placed on the amount which may be carried forward in the profit and loss account to a succeeding year. A special purposes fund, from which "extraordinary claims or demands" may be met, is allowed to be formed out of revenue, but the yearly appropriation to this fund and the maximum amount in the fund are limited. A "renewal" fund to equalise maintenance charges is also allowed, but is limited in the same way as the special purposes fund.

It would therefore appear that over-capitalisation is unlikely to exist to any serious extent in connection with statutory gas companies. In so far as it has occurred, it has taken the form of over-expenditure of capital in relation to the potential sales of gas. It is possible that in some cases, owing to the yearly maintenance theory, where this is rigidly applied, part of the capital expenditure of gas companies may cease to be represented by capital assets, and in such cases, if the company shows that it is desirable, the writing off of specified amounts of obsolete capital out of revenue is sanctioned. It is improbable, however, that this condition exists at the present time to any great extent, especially in view of the rise in costs due to the war.

In order to consider to what extent (if at all) over-capitalisation, if it existed, would be likely to affect the price of gas, it is necessary to consider the manner in which dividends and prices are regulated. Two systems are in operation for this purpose. Under the one system, a maximum rate of dividend and maximum price of gas are fixed. The other system consists in the fixing of a standard price of gas which corresponds with a standard rate of dividend, and requiring the rate of dividend to be reduced if the price rises, while, if the price falls, the rate of dividend may be raised. In view of the fact that the maximum or standard prices and rates (as the case may be) are fixed by an independent authority (Parliament or the Board of Trade) a substantial safeguard clearly exists against the charging of prices calculated to provide dividends on inflated capital. It will be appreciated that should over-capitalisation nevertheless result in a high price it would, owing to the restrictions set out above, bring about diminished dividends; and it would be to the interest both of the shareholders and of the consumers (through their representatives, the local authorities) to take steps to relieve the undertaking of the excessive capital.

**CHAPTER IV.****TRANSPORT FACILITIES****CONTENTS.**

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## TRANSPORT FACILITIES.

## INTRODUCTORY.

The vast question of transport can, broadly speaking, be considered from two points of view. It can be regarded primarily as an industry or primarily as a service essential to the carrying on of every kind of industry and commerce. Upon whichever of these aspects attention is concentrated, transport is of the first importance in the industrial life of Great Britain.

Regarding transport for the moment as an industry, its importance in the economic life of the country can readily be shown by a few figures as to the magnitude of the financial interests involved and of the number of persons employed. As to the importance of the financial aspect, the net national income from shipping services (i.e. gross earnings of British shipping, less disbursements in overseas ports but including disbursements of foreign ships in British ports) is estimated to have amounted to £124 millions in 1925, £120 millions in 1926, and £140 millions in 1927. The paid-up capital of the railway companies of Great Britain is in the region of £1,175 millions. In the nature of the case it is not possible to give such definite figures in regard to the rapidly developing and much less closely organised road transport industry ; but there are more than 370,000 motor commercial vehicles and hackneys licensed in Great Britain, and the purchase and operation of these must clearly involve a very considerable capital, the amount of which, however, cannot be estimated with any degree of accuracy. Further, there are over 2,600 miles of tramways and light railways, the capital involved being only slightly less than £100 millions. As to the numbers of persons employed, the available information shows that transport employs fully one and a-half million people, or nearly 8 per cent. of the whole employed population.\* This figure takes no account of the numerous persons indirectly dependent on transport, e.g., those engaged in building and repairing the ships and vehicles, those employed in the many

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\* The number of persons employed in vessels of 100 net tons and over belonging to the United Kingdom and engaged in trading in 1926 was 229,688 (including 18,375 foreigners and 56,444 lascars) The staff employed by the railway companies in Great Britain was 689,264 in 1926 and 683,077 in 1927. The numbers of persons in "Tramway and Omnibus services and other road transport" insured under the Unemployment Insurance Acts in 1927 was 306,900 and in "Canal, River, Dock, and Harbour Services, Other Transport, and Storage" the number was 199,730 ; in addition there are numerous uninsured persons such as private chauffeurs (25,857 of whom were recorded in the Census of 1921), owner-drivers of commercial vehicles and hackneys, employees in receipt of more than £250 a year, employers, etc.

commercial occupations directly connected with the transport services, or those in the various industries largely or mainly dependent upon supplying the requirements of shipping, the railway companies, and road transport.

The foregoing figures suffice to show the importance to the community of transport regarded solely as an industry. It is, however, as a service to other industries that the question of transport will be mainly regarded in the following pages. From this point of view the first thing to note is the vital importance of the adequacy of the service of transport to an island population of 43 million, which imported merchandise to the average value of £1,280 millions per annum during the three years 1924-26, and whose exports (including re-exports) of merchandise during the same period averaged £882 millions yearly in value. On the average of these three years, 73 per cent. of the value of the imports represented food and raw materials for industry, and nearly 80 per cent. of the value of the exports represented manufactured goods. The relation of the transport services to this huge volume of commerce, without which the population concentrated in the British Isles could not exist, was aptly described by a witness before the Committee as "the means by which British exports are placed on the markets of the world, and British imports are brought into this country."

The transport services in anything like their present efficiency or importance are of quite recent development. The transport system, carried on by sea, river and road, was on the whole no better in the earlier half of the eighteenth century than it had been in the days of the Roman occupation, for, though there were more boats and ships of perhaps improved size and design, the Roman roads had been allowed to fall into utter disrepair. In 1761, however, the Manchester-Worsley canal was opened and a period of great activity in canal construction followed, continuing until the introduction of railways. Between about 1790 and 1830 the application of Macadam's process to road making and the construction during the same period of many new roads, such as those of Telford, greatly increased the speed of horse-drawn traffic. It was not, however, until the third decade of the nineteenth century that practicable locomotives were produced, and not until after 1830 did the construction of railways begin on any appreciable scale. Then one result was the almost complete supersession of the roads by the railways for long-distance commercial traffic. The first British steamboat plied for hire in 1811, but not until the fifth decade of the century did the number of steam vessels owned in the United Kingdom reach 1,000. As the motor car did not reach a state of practical utility before the first decade of the twentieth century, it is only during the last twenty years that the country has had the triple services of fast mechanically propelled traffic by sea, railway and road.

In examining the working of these services and the use made of them, it will be convenient first to have regard to the distribution of the population and industries to be served, and secondly to take account of each of the three services individually.

#### DISTRIBUTION OF THE POPULATION TO BE SERVED.

It is obviously easier for a transport service to supply adequately the needs of a population concentrated in large groups than those of a scattered population. The problem will be still easier, especially in the case of a nation with a large import and export trade, if the concentrations are near the sea and particularly near large ports. In that event, not only will masses of the population be situated as conveniently as possible for receiving sea-borne supplies and for placing their products for export at a low freight cost on board ship, but each of the three main forms of transport—sea, rail and road—will be at their disposal for purposes of home trade. It will, therefore, be the next purpose of this memorandum to show :—

- (a) How far the population of Great Britain is grouped near the large ports.
- (b) How far it is grouped in towns and how far in more scattered rural communities, and
- (c) How far it is concentrated in a few large masses.

#### Concentration near the Principal Ports.

The twelve principal ports of Great Britain, if a balance is struck between the value of imports and exports and the net tonnage entered and cleared, are London, Liverpool, Hull, Southampton, Glasgow, Newcastle, Manchester, Cardiff, Bristol, Grimsby, Leith, and Dundee\*. In 1913 these twelve ports handled 84 per cent. of the value of the imports, 84 per cent. of the value of the exports and 90 per cent. of the value of the re-exports of Great Britain,† and, in 1925, 86 per cent. of the imports, 88 per cent. of the exports and 91 per cent. of the re-exports. Of net tonnage (sail and steam, with cargo and in ballast) 83 per cent. of the entrances and 82 per cent. of the clearances in the foreign trade at ports in Great Britain† were made at these twelve ports in 1913 and 87 per cent. of the entrances and 85 per cent. of the clearances in 1925.

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\* Certain important ports which might be included either on the value or tonnage basis, or even both, are excluded for various reasons, e.g., Dover, Folkestone and Harwich, being primarily cross-channel ports; Goole and Newport, being largely covered by Hull, Cardiff and Bristol; Plymouth, whose traffic is largely due to the calling of Atlantic liners; Swansea and Middlesbrough, which are predominantly exporting ports and whose trade is of a specialised kind, and not, comparatively, extensive.

† Excluding all Irish ports, whether now situated in Northern Ireland or in the Irish Free State.

The following figures of the population within a radius of 15 miles of the twelve ports have been supplied by the Registrars-General for England and Wales and for Scotland. They are based upon the census of the years shown :—

Population within 15 miles of the centre of—	1881.	1891.	1901.	1911.	1921.
London ..	4,944,509	5,857,906	6,877,319	7,621,795	7,913,543
Liverpool ..	1,123,003	1,249,396	1,398,562	1,566,768	1,698,315
Hull ..	256,939	290,843	332,777	381,442	397,608
Southampton ..	235,826	259,547	303,566	355,033	381,736
Newcastle ..	867,223	1,055,496	1,278,388	1,490,375	1,592,728
Manchester ..	1,976,848	2,242,226	2,493,009	2,728,705	2,761,265
Cardiff ..	346,927	508,115	657,820	856,176	955,042
Bristol ..	470,307	512,102	561,860	591,627	618,876
Grimsby ..	104,701	114,795	132,124	160,133	179,397
Glasgow ..	1,110,175	1,300,300	1,576,471	1,743,646	1,812,081
Leith ..	500,323	567,442	653,448	726,395	745,120
Dundee ..	247,446	259,367	268,487	271,789	263,765
I Total of above	12,183,227	14,217,535	16,533,831	18,493,884	19,319,478
II. Population of Great Britain	29,710,012	33,028,172	36,999,946	40,831,396	42,769,196
Proportion I to II	41·0%	43·4%	44·7%	45·3%	45·2%

*Notes.*

(i) In regard to England and Wales, no *parts* of civil parishes are included, either the whole is included or excluded, as the case may be. The areas (civil parishes, etc.) are as constituted at the date of the Census of 1921, and the figures are comparable.

(ii) In regard to Scotland, entire parishes have been taken as included in the circle when the greater part of the parish population is there, while those with the greater part outside the circle have been excluded.

(iii) Certain of the figures constituting the totals for Hull and Newcastle in 1881 and 1891, and for Liverpool, Southampton, Manchester and Bristol in 1881, are estimated but cannot be far from accuracy, and can in no way affect the total to any extent.

(iv) The total is not strictly accurate, as in the case of Hull and Grimsby there is an overlap. This can, however, affect the total only to a slight extent and the proportion of that to the whole population even less. The year to year comparison, generally speaking, should be almost unaffected.

The concentration near the large ports at the last census was thus over 45 per cent. of the whole population of Great Britain. This proportion, of course, does not represent the whole of the population which is within easy reach of sea-transport, as a large number of smaller ports are in existence. The number of ports in Great

Britain\* for which figures are given in the Annual Statement of Trade is 101. As was mentioned above, however, the great bulk of the overseas trade is done through the twelve named ports, and the fact that almost half the population is concentrated close to them must be considered as an asset of primary importance to a trading nation dependent for its prosperity upon overseas supplies and export trade.

As to the trend of this concentration near the big ports of Great Britain the figures given above show that the proportion rose steadily from 41 per cent. in 1881 to over 45 per cent. in 1911, and remained stationary at that figure during the following decade. Between 1881 and 1921 the population near the twelve ports increased by 59 per cent. as compared with an increase of 44 per cent. in the population of Great Britain.

The percentage decennial rates of increase, however, were:—

Population of	Percentage Increase.			
	1881-1891.	1891-1901	1901-1911.	1911-1921.
Twelve principal ports of Great Britain	16.8	16.3	11.9	4.5
Great Britain .. ..	11.1	12.0	10.4	4.7

This table brings out the fact that while the population near the ports increased more rapidly than the total population in each of the three decades between 1881 and 1891, the difference between the two rates was regularly narrowing, until, in the decade 1911-21 the population near the ports actually increased at a smaller rate than that of the whole population. The cause of this is not obvious. It may be that the process of concentrating near the ports has died down, owing to the areas near the ports being already occupied, to improved road transport facilities making more distant concentrations possible, or to the growth of industries in areas hitherto predominantly rural. On the other hand, it may be that the inclination towards concentration near the ports remained, but that war conditions and the housing difficulties restrained it during the decade 1911-21. Whichever may be the case, the answer can only be given by the census of 1931.

#### Concentration in Towns.

It is possible to compare in regard to England and Wales the rate of concentration round the principal ports with the rate of concentration in urban areas and, at the same time, to show how far the

\* Excluding the Isle of Man and the Scilly Islands.

population is grouped in towns. The figures of persons in Urban Districts (including County and Municipal Boroughs) are :—

	1881.	1891.	1901.	1911.	1921.
Population in Urban Districts	17,285,026	20,895,355	25,058,355	28,162,936	30,034,385
Population of England and Wales	25,974,439	29,002,525	32,527,843	36,070,492	37,885,242
Proportion of Population of Urban Districts to total Population	66·6%	72·0%	77·0%	78·1%	79·3%

Thus, the population in Urban Districts rose from 66·6 per cent. to 79·3 per cent. of the whole, while the population near those of the large ports (nine in number), which are situated in England and Wales, was rising from 39·8 per cent. to 43·6 per cent. of the whole. Between 1881 and 1921, the population in the Urban Districts rose by over 12 millions, or 74 per cent., while the population near the nine ports rose by over 6 millions, or 60 per cent.

As to the rates of increase the figures are :—

Population of	Percentage Increase.			
	1881–1891.	1891–1901.	1901–1911.	1911–1921.
Nine Principal Ports ..	17·1	16·1	12·2	4·7
Urban Districts* ..	15·4	15·2	11·1	5·2

\* i.e. The increase in population in the areas as constituted at the rate of each Census over the population of the same areas at the previous census.

This table, like that immediately preceding it, indicates that the drift over the period towards the big ports has been part of the general drift into urban areas, and that this general drift has been slowing down during the whole period 1881–21, having, in fact, come to a standstill during the decade 1911–21. From the point of view of transport services, however, the fact that nearly 80 per cent. of the population was concentrated in urban districts and, consequently easily accessible to rail and road, if not necessarily to sea or river, is of great significance.

### Concentration in Large Groups.

As to the concentration of the population in large masses, there are five great groups, those in greater London, round Birmingham, in Lancashire and the West Riding of Yorkshire, in Glamorgan, and round Glasgow and Edinburgh. The figures are :—

District.	Population.	Area (acres).
Greater London* .. .. ..	7,476,168	443,449
Warwickshire and Staffordshire .. .. ..	2,739,317	1,346,593
Lancashire .. .. .. ..	4,927,484	1,194,555
West Riding .. .. .. ..	3,181,174	1,778,529
Glamorgan .. .. .. ..	1,252,710	520,456
Lanark, Renfrew and Midlothian ..	2,344,572	951,330
<b>Total</b> .. .. ..	<b>21,921,425</b>	<b>6,229,912</b>
Percentage of Great Britain .. ..	51·3	10·7

\* i.e. Area covered by City of London and Metropolitan Police Districts.

Thus, 51 per cent. of the population of Great Britain are concentrated in five large groups in areas which, together, aggregate less than 11 per cent. of the area of the country.

To sum up, the transport services have to provide for a population nearly half of which is within fifteen miles of a large port, four-fifths of which is concentrated in or round towns, and more than half of which is grouped in five areas which between them comprise only one-tenth of the area of the country.

### DISTRIBUTION OF IMPORTANT INDUSTRIES.

#### Distribution of British Industries.

It is not practicable to sub-divide the various industries of the country into geographical groups with the same accuracy and detail as can be done in regard to the population at large. Further, it is doubtful whether the result, regarded merely from the point of view of transport services, would be of much significance, when it has once been established how the population to be served is grouped. The needs of the population, however grouped, have to be supplied whatever their occupation may be. The general location of the exporting industries is of importance, as the nearer they are to the sea and port facilities the lower the charges for land carriage should be on their exported products, while their proximity, or otherwise, to the coalfields must have an important effect upon the fuel bill and, consequently, upon costs of production. The purpose of this section, accordingly, will be to indicate generally the areas in which the eight

exporting industries selected by the Committee are mainly centred. The industries are Coal, Iron and Steel, Engineering and Shipbuilding, Electrical Manufacturing, Cotton, Woollen and Worsted, Chemicals, and Clothing (including Boots and Shoes). The exports of the products of this group amount in value to nearly four-fifths of the export of manufactures of the United Kingdom, while a quarter of the occupied population is engaged in these industries.

*Coal.*—The areas into which the industry was divided by the Royal Commission of 1925 were :—

				Percentage of Total Saleable Coal Raised.	Percentage of Number of Workpeople.
1.	Scotland (Lanark, Fife, Lothians, Ayrshire) .. .. .. ..		14	11	
2.	Northumberland .. .. .. ..		5	5	
3.	Durham .. .. .. ..		14	14	
4.	South Wales .. .. .. ..		19	19	
5.	Eastern Area (i.e. Yorkshire, Derbyshire, Notts, Leicester and Warwickshire) .. .. .. ..		35	33	
6.	Lancashire, N. Staffs, Cheshire .. .. .. ..		10	13	
7.	North Wales .. .. .. ..		1	2	
8.	S. Staffs and Salop .. .. .. ..		1	1	
9.	Cumberland .. .. .. ..		1	1	
10.	Bristol .. .. .. ..		0·1	0·1	
11.	Forest of Dean .. .. .. ..		0·5	1	
12.	Somerset .. .. .. ..		0·4	0·5	
13.	Kent .. .. .. ..		0·2	0·1	

From the point of view of transport facilities, the important points to note, in regard to export trade, are (i) that of these thirteen divisions only the areas of South Stafford and the parts of the Eastern Division other than Yorkshire, are situated in countries without a sea-board, and (ii) that nine of the large ports dealt with above are situated in one or other of these areas. In regard to the home trade, five of these areas, producing 79 per cent. of the output, are situated in one or other of the great concentrations of population mentioned above. Two facts may be noted to show the effect of the location of the coalfields. First, as an example of the convenience of the geographical position, the average haul of coal for shipment in the period 1921–25 was  $25\frac{1}{4}$  miles, and for land sale coal  $55\frac{1}{4}$  miles. (The average rail haul for all freight traffic in the same period was 54 miles). Secondly, as an example of the use that is made of the availability of two forms of transport, 53 per cent. of the coal bought for use in Greater London came by rail, and 47 per cent. by sea in 1925.

*Iron and Steel.*—It was stated in evidence before the Committee on Industry and Trade that “ the location of the blast furnaces has depended upon a variety of considerations, the most important of which has been the reduction to a minimum of transport charges upon materials and products which are both bulky and heavy.” The following table, which relates to the year 1924, will show how the industry is concentrated :—

District.	Production of Pig Iron.	Production of Steel Ingots and Castings.	Number of Blast Furnaces.	Weekly Capacity of Blast Furnaces.
Percentage of Total.				
<i>Coast Districts.</i>				
1. North-East Coast ..	30.6	20.9	22.4	30.8
2. Scotland .. ..	9.2	15.1	20.9	9.6
3. South Wales .. ..	12.0	27.5	5.4	11.4
4. West Coast .. ..	9.8	1.8	9.3	12.9
	61.6	65.3	58.0	64.7
<i>Inland Districts.</i>				
5. Parts of Lancs. and Yorks (including Sheffield)	7.8	12.6	6.9	9.2
6. Lincolnshire .. ..	9.0	5.7	5.2	6.3
7. Derby, Leicester, Notts and Northants	15.1	6.2	15.4	9.4
8. Staffs, Salop, Worcester and Warwick	6.5	10.2	11.2	9.5
	38.4	34.7	38.7*	34.4†

\* Balance of 3.3 per cent. not stated.

† Balance of 0.9 per cent. not stated.

The table brings out clearly the manner in which the industry is carried on near the sea. It is, further, worth noting that five of these eight districts contain at least one of the twelve large ports and that only one of the coast districts (the West Coast area) is not close to one of these ports. Four of the eight districts, producing 36 per cent. of the total pig iron and 65 per cent. of the ingots and castings fall into one of the five great concentrations of population. Further, all the eight districts, except, perhaps, Lincolnshire, are in or immediately adjacent to one of the coalfields, though the local coal is not necessarily used in every case to the complete exclusion of possibly more suitable coal brought from other areas. Iron ore is found in every one of the eight districts. The effect of the geographical distribution of the industry is shown by the figures of average hauls on the railways for the period 1921-24. These were 44 miles for iron ore, 48 miles for pig iron, and 41 miles for iron and steel ingots, the average haul of all freight for the same period being, as already noted, 54 miles.

*Engineering.*—As might be expected from the diverse nature of its products, both as regards weight and bulk, the engineering industry is widely distributed, though certain sections of it tend to concentrate in particular areas, e.g. 34 per cent. of those engaged in agricultural engineering were in Lincolnshire and 13 per cent. in Suffolk in 1921, and 60 per cent. of those engaged in the manufacture of textile machinery were in Lancashire and 23 per cent. in the West Riding of Yorkshire. How widely the general engineering industry (i.e. excluding agricultural engineering, the manufacture of textile machinery, and marine and electrical engineering) is scattered can be seen from the following percentages of the total numbers engaged in it in 1921 :—Lancashire 15, Lanark and Renfrew 12, London 11, West Riding of Yorkshire 10, Cheshire 5, Durham and Warwickshire 4 each, and Essex, Kent, Northumberland and Staffordshire 3 each. (These comprise all the counties in which more than 10,000 persons were engaged in the industry). The remaining 27 per cent. were distributed throughout the country. About 33 per cent. of those engaged in the industry were in the twelve large ports.

*Shipbuilding, Ship Repairing and Marine Engineering.*—This industry is of necessity concentrated on or very near to the coast. In this case also some figures of the percentages of the total numbers engaged in it as shown by the Census of 1921 will best indicate the chief centres, of which two predominate—the north-east coast of England and the Clyde. Of the total engaged, 26 per cent. were on the Tees and Tyne,\* and 22 per cent. in the Clyde area†; that is, nearly half those engaged in the industry were in these two districts. Both of these areas are close to a great coalfield, and both are districts containing over a fifth of the blast furnaces. Other substantial centres of shipbuilding or repairing are Hampshire (Southampton and Portsmouth) containing 8 per cent. of those engaged, the Mersey‡ 7 per cent., Barrow 4 per cent., Plymouth 4 per cent., and Kent (Chatham and part of the Thames) 4 per cent.§

*Electrical Manufacturing.*—Judging by the percentages of the total number engaged, as shown by the Census of 1921, the industry is mainly centred in Greater London, Lancashire and Warwickshire. In the manufacture of generators, motors, etc., the percentages were Lancashire 32, London 15, Warwickshire 15, a total of 62 per cent. ; in the manufacture of cables, etc., they were London 55 and Lancashire 15, a total of 70 per cent. ; in the manufacture of incandescent

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\* Northumberland, Durham and the North Riding of Yorkshire.

† Lanark, Renfrew and Dumbarton.

‡ Birkenhead, Bootle and Liverpool.

§ These percentages are exclusive of Belfast, which is an important centre of the industry, ranking with the Clyde and the North-east Coast. It is conveniently placed to draw raw materials by sea, particularly from Scotland, and its launching facilities, particularly as to deep but sheltered water, are very great.

lamps 80 per cent. were in London ; electrical wiring and contracting is, of course, scattered throughout the country ; and in "other electrical manufactures" the percentages were London 33, Lancashire 26 and Warwickshire 15, a total of 76 per cent.

*Cotton.*—The cotton industry, the classic example of the import of a raw material and the export of a finished product, provides an excellent instance of concentration in an area exceptionally well suited to the industry's transport requirements. The South Lancashire district is not only within easy reach of the two great ports of Liverpool and Manchester—very few of the cotton districts are more than 30 miles from the latter—but contains a coalfield producing 10 per cent. of the saleable coal raised. The extent to which the cotton industry is concentrated in the area is shown by the fact that, according to the Census of 1921, 78 per cent. of those engaged in the industry were in Lancashire and 13 per cent. in the adjacent districts of North Cheshire and the West Riding of Yorkshire. The average rail haul of raw cotton in the period 1921–24 was 41 miles.

*Woollen and Worsted.*—The industry, particularly the worsted section, provides an example of concentration similar to that of the cotton industry. In 1921, of those engaged in woollen manufacture 68 per cent. were in the West Riding of Yorkshire (15 per cent. were in Scotland) and of those engaged in worsted manufacture 93 per cent. were in the West Riding. Taking the woollen and worsted industry as a whole 80 per cent. of those engaged in it were in the West Riding. The area is absolutely continuous, in the sense that there are no outlying textile areas. The western part of the area, e.g. around Huddersfield, is within 40 miles of Manchester and the eastern part, e.g. around Leeds, within 50 miles of Hull. As these distances are upon the whole greater than the distances of the cotton towns from the ports of Liverpool and Manchester, and as much of the raw wool is brought by rail from London, the average rail haul of raw wool is greater than that of raw cotton, being 107 miles for the period 1921–24. The West Riding textile area overlaps the Yorkshire coalfield, so that the industry is well placed to obtain fuel supplies.

In connexion with the textile industries it is of interest to note that, of those engaged in textile dyeing, printing, bleaching and finishing, 50 per cent. were in Lancashire, 25 per cent. in the West Riding and 15 per cent. in Scotland.

*Chemicals*—Taking the manufacture of chemicals as a whole,\* the largest centres, according to the percentages of the total number engaged as shown by the Census of 1921, were greater London 22 per cent., Lancashire 21 per cent., Cheshire 12 per cent., Scotland 9 per

\* i.e. Alkalies and Heavy Acids, Tar and Wood Distillation, Dyes, Drugs and Fine Chemicals, Fertilizers, etc., and "Manufacture of other chemical products."

cent., and the West Riding 6 per cent., leaving 30 per cent. distributed throughout the country. As to the principal sections of the industry, the main concentrations were :—Manufacture of Alkalies and Heavy Acids 34 per cent. in Lancashire and Cheshire, manufacture of dyes 43 per cent. in Lancashire and Cheshire, and 37 per cent. in the West Riding, manufacture of drugs and fine chemicals 42 per cent. in Greater London. Upon the whole, therefore, the greater part of the chemical industry is situated in the sea-board counties and within the five great concentrations of population.

*Clothing.*—The three main divisions of the clothing trades are Tailoring, Dress and Blouse Making, and the manufacture of Boots and Shoes. The distribution of these can best be shown by means of the proportions of the total engaged in them as shown by the Census of 1921. As to Tailoring, the three main centres were Greater London 27 per cent., the West Riding 15 per cent., and Lancashire 14 per cent., a total of 56 per cent. in these three areas. As to Dressmaking, London is the predominating centre, containing 32 per cent. of those engaged ; otherwise the trade is widely scattered. The two large centres of the Boot and Shoe industry are Northamptonshire, containing 20 per cent. of the total number engaged and Leicestershire, containing 17 per cent. ; there were 12 per cent. in Greater London, the remaining 51 per cent. being distributed throughout the country.

#### Distribution of Foreign Industries.

The foregoing brief notes on the location of the exporting group of British industries suggest that they are each very favourably situated for obtaining raw materials and for placing their products upon the ocean. It is, accordingly, of interest to test this suggestion, necessarily somewhat roughly, by means of a comparison with the location of these industries in other important industrial countries, e.g. Belgium, France, Germany and the United States.

First as to coal, it has been shown above that in Great Britain over 40 per cent. of the total output is raised in areas actually on the coast and 80 per cent. in counties with a sea-board. The only other working coalfields in the world actually on the coast are those in Nova Scotia and in Japan, neither of which rank among the important producing areas. The Belgian coalfield is at no point within 50 miles of the coast (Mons—Antwerp) and, generally, is substantially more than that distance from the sea ; and the adjoining French coalfield, while it approaches to within some 35 miles of the sea (Bethune—Dunkirk) stretches away from it until the distance is more than doubled at Valenciennes on the Belgian frontier. The other French coalfields are all situated inland and are comparatively small. The Saar field, though on a navigable river, is far from the sea. Germany, in spite of the loss of the Saar, Alsace-Lorraine and Upper Silesian coalfields, remains the principal exporting country

after Great Britain. Its exports, however, are almost entirely overland to other European countries, but as Germany, with its large potential output, might become an important competitor in markets entailing sea transport it is of importance to note the position of her coalfields. Those in Lower Silesia and in Saxony are obviously badly placed for the purpose and, in any event, are small when compared with the Ruhr with its potential annual output of something like 150 million tons. At the nearest point the Ruhr field is not within 100 miles of the coast (Antwerp or Rotterdam), and, at the furthest, over 150 ; but the field is singularly well placed in regard to navigable waterways as it overlaps both the Rhine and Rhine-Ems canal. Except for the coastal fields of Great Britain, the Ruhr coalfield is clearly the best placed in Europe for purposes of an overseas export trade. The United States only exports about 5 per cent. of the output, and that mainly overland to Canada, but the production is now 500-600 million tons and the potentialities enormously greater even than this. The nearest field to the sea, however, the anthracite field of Pennsylvania, is at its nearest point over 100 miles inland, and the nearest points to the coast in the Pennsylvanian, West Virginian and Appalachian bituminous fields are over 150 miles distant. The coalfield of Illinois and the great potential fields of Kansas, Oklahoma and the middle west are all situated many hundreds of miles inland.

As to the Iron and Steel trades, it has been seen that about 60 per cent. of British production is in the coastal districts. The Belgian industry is almost entirely confined to the Mons-Liege line, i.e. the line of the coalfield, and is thus well placed in regard to supplies of Belgian or Lorraine ores. On the other hand, the area is more than 50 miles from the sea. In France, the industry is carried on in the industrial area of the north-east, i.e. in a coalfield and near ore supplies and some 40-70 miles from the sea ; in Lorraine, i.e. where the ore is found and near the Saar coal but 200 miles from the sea ; in Paris, in certain of the ports, e.g. Havre, Nantes, Marseilles, Toulon, which are distant from coal supplies, and in numerous smaller areas which are usually near to supplies of ore, but distant from important coalfields and from the sea. The iron and steel industry of Germany, as in the case of coal, is dominated by the Ruhr district, which has supplies of ore 50-100 miles distant, at Siegen and in the Vogelsberg and some 200 miles distant in Lorraine. The iron and steel industry of the Ruhr has the other geographical advantages already noted in the case of coal. The industry is also carried on in Silesia (Bielau) near coal and ore but remote from the coast, in Hanover where there are supplies of ore and in some of the great ports, such as Bremen and Stettin to which, however, the raw materials have to come either from overseas or from considerable distances inland. The main centres of the industry in the United States are the Chicago area, the Pittsburg-Cleveland area, the

Detroit area, all of which are close to a coalfield and depend for ore upon the deposits near Lake Superior, and the Birmingham area in Alabama, where both coal and ore are found. The nearest of these areas to the sea, Pittsburg, is 250 miles inland. Chicago, Detroit and Cleveland, as well as the Lake Superior area, are situated on the Great Lakes, so that, except in the winter months when the lakes are frozen, there is water transport available between the areas themselves. The route to the sea via the St. Lawrence through Canadian territory is one of over 600 miles from Detroit or Cleveland, and of about 1,200 miles from Chicago to Quebec.

The engineering industry is scattered in each country, as is the case in Great Britain. In the case of shipbuilding, in no country do the advantages of geographical position equal those of Great Britain, half of whose shipbuilding is carried on in two areas raising nearly a quarter of the coal and containing two-fifths of the blast furnaces. That this is so is obvious from the fact that shipbuilding must be concentrated on or near the coast, and that practically no country, as has been said, has a coalfield on the sea coast. Antwerp is comparatively well placed, having coal and steel about 50 miles distant. Of the French shipbuilding centres, Havre, Nantes, Marseilles and Toulon have steel works, but these are distant from the French coalfields. Hamburg, the greatest German shipbuilding centre, is over 200 miles from the steel works of the Ruhr and about 100 miles from the Hanoverian works. In the case of Bremen, another shipbuilding centre, the distances are about half those of Hamburg, but they are considerably greater in the case of the other centres, such as Kiel, Lübeck and Stettin. The shipbuilding centres of Maine, Massachusetts and New Jersey are distant from the principal steel-producing areas of the United States, and in the case of San Francisco the distance to Chicago is over 2,000 miles by land. Ships are, of course, built and launched on the Great Lakes at Chicago, Detroit, etc.

The main cotton manufacturing areas of Europe are the Lille-St. Quentin district and Alsace-Lorraine in France, the Ghent-Brussels-Louvain district in Belgium, and the Ruhr and South Saxony districts in Germany. All these, like South Lancashire, are adjacent to coal, but they are all further from the sea than South Lancashire and, consequently, a larger land-haul for the raw material is involved. In the United States the principal cotton manufacturing districts are in New England (round Boston, in Connecticut, and round Philadelphia) and in certain southern states, i.e. coastal districts necessarily distant from the main coalfields.

As to the woollen industry, the principal centres in Belgium, France and Germany are the same as the cotton areas, though the industry is carried on in various other parts of these countries and is, consequently, more scattered than is the case with cotton. There is an American woollen manufacturing industry, but as the United

States still import woollen manufactures in large quantities, it needs no mention in the present connexion.

Electrical and chemical manufacturing are carried on in each of the four countries, mainly in the chief industrial areas already described above in regard to the coal and the iron and steel industries.

This account of the broad geographical position in other industrial countries of the industries which provide the great bulk of British exports appear to confirm the suggestion that the British industries are placed in very favourable positions, being closer to the sea, more compact, and better placed *vis-a-vis* one another than those of rival countries. No doubt this is due to the location of the British coal-fields, but the result remains, and may be seen from the following figures of the average freight rail-haul in the five countries :—

					<i>Miles.</i>
Great Britain (Average, 1920-25)	..	..	..	..	54
Belgium (1913)	..	..	..	..	53.5
France (1913)	..	..	..	..	77.3
Germany (1922)	..	..	..	..	91
U.S.A. (1924)	..	..	..	..	301

The conclusion seems inevitable that British industries enjoy in their geographical position a definite and permanent advantage, provided only that the transport services are adequate and efficient enough to enable the advantage to be utilised in practice. The next purpose of this chapter will consequently be to give some account of the transport facilities available.

#### FACILITIES AVAILABLE.

##### Railways.

###### *Growth and Development.*

The first Act of Parliament for the construction of a railway was obtained in 1801, and a steam carriage was used on a railway for carrying coal as early as 1804, being found, however, more expensive than horses. The first steam railway for passenger traffic, the Stockton-Darlington, was opened in 1825, and the Manchester-Liverpool railway in 1830. Up to 1840 Parliamentary powers had been obtained authorising the construction of about 3,000 miles of line, while by 1850 about 6,000 miles of line were open for traffic. By 1913 the mileage (i.e. length of road) was 20,246, and in 1925 20,391, of which practically 20,000 miles were operated by the four large groups. In 1925 the railway companies owned over 24,000 locomotives, and about 51,000 passenger-carrying vehicles, in addition to 770,000 merchandise, mineral and railway service vehicles, while there are something like 600,000 privately owned wagons in Great Britain. In 1925 the engine mileage run was, approximately, 262 million on coaching traffic, and 141 million on freight traffic.

In that year the railways carried over 1,700 million passengers, 60 million tons of general merchandise, 256 million tons of coal, coke and other minerals, and over 18 million head of live stock.

The relation of the length of line to the area and population of Great Britain and other industrial countries is shown by the following figures :—

			One mile of railway to every	
			4·4 square miles	2,140 inhabitants
Great Britain	..	..	4·4 square miles	2,140 inhabitants
Belgium	..	..	1·7 square miles	1,070 inhabitants
Germany	..	..	5·4 „ „	1,670 „
France	..	..	6·4 „ „	1,180 „
Italy	..	..	9·3 „ „	3,020 „
U.S.A.	..	..	11·9 „ „	420 „

#### *Conditions of Working.*

The great change from road to rail transport was carried out by private enterprise with little guidance or control by Government. In consequence, a very large number of comparatively small and competing companies came into existence. A tendency to amalgamate, however, soon showed itself, and, though there were still numerous independent companies in existence in 1913, there were then sixteen companies which owned the very great majority of the mileage and rolling-stock. For the period of the war the railways were subject to Government control, the Government guaranteeing the companies the net revenue they had had in 1913. The control came to an end in August, 1921, in which month the Royal Assent was given to the Railways Act, 1921. Under that Act :—

- (a) The numerous freight-carrying companies were substantially formed into four large groups (the details of the schemes of amalgamation or absorption need not be described in the present connexion).\*
- (b) The old power under which the companies can be required by the Railway and Canal Commission, after a proper complaint, to afford reasonable services, etc., was retained.
- (c) A new permanent tribunal, known as the " Railway Rates Tribunal," was set up to deal with railway rates and charges. These were to be fixed at a level calculated to yield, after payment of all working expenses, an annual net revenue equivalent to the aggregate net revenues realised in 1913, plus allowances on additional capita

\* A number of freight-carrying companies of small importance and some important passenger-carrying lines, e.g., the London Electric Railways, were not included in the groups.

invested since that year. Provision was made for periodic and constant review of charges by the Tribunal.

(d) The companies and trade unions were bound to refer all matters affecting the agreements they arrived at as to wages, hours, and conditions of work, etc., through a certain procedure before they took independent action, although neither party bound itself to accept the result of the procedure.\*

It will be seen that in place of the previous system of statutory maximum charges the rates charged are subject to the control of an independent body having statutory powers, and that another independent body has power to hear complaints as to inadequate services, and even to require improvements to be made, while provision is made for independent investigation and publicity in regard to the relations between the companies and their employees.

#### *Efficiency of Working.*

Generally speaking, the criticism of the railway companies made by the witnesses before the Committee on Industry and Trade were to the effect :—

- (1) That rates charged were in one way or another too high ; and
- (2) that as a result of amalgamation and the lessening of competition, the efficiency of the railways has deteriorated.

As to the former the answer, broadly speaking, given by the companies in their evidence was that the increase in rates and fares was in 1924 approximately 50 per cent. over the 1913 rates, an increase substantially less than that of either wholesale or retail prices.† The various reductions made since the "peak" (September, 1920–October, 1921) followed negotiations between the companies and representatives of traders. The Act of 1921 provided that, until the "Appointed Day" when the new charges fixed by the Railway Rates Tribunal came into operation,‡ the companies could make the charges in force in August, 1921, but that traders could apply to the Tribunal for reductions in the charges in operation. As to the criticism that continental rates were "much less than in this country," the reply of the companies was to the effect that the general level of rates per mile in continental countries was probably lower than in this country owing to the greater length of haul, the different character of service and facilities provided, the generally lower level of costs, the fact that continental railways are non-competitive and sometimes financed by the State, and currency inflation. On the

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\* This machinery is fully described in the "Survey of Industrial Relations," pp. 277-9.

† Since the date on which this evidence was given this increase has gone up to about 60 per cent. and the general level of wholesale and retail prices has fallen.

‡ These new charges came into operation on 1st January, 1928

question of post-amalgamation efficiency, the railway companies expressed the opinion that some of the results anticipated by the public from amalgamation were too much to expect in any case, but that some might have come about had the period concerned been one of good trade instead of bad. As to general efficiency, the railway companies stated that the best test of freight train work are the figures of net ton-miles per engine-hour, ton-miles representing the work done and the engine-hour the amount of effort put into that work ; the more ton-miles per engine-hour were shown the better the working would be. The figures were :—

	Ton-miles per engine-hour.		
	1920.	1924.	1925.
Train working .. ..	865	916	901
Shunting .. ..	824	857	839
Total .. ..	422	443	434

As to delay and unpunctuality, the railway companies supplied the result of a test carried out on the North-Eastern line in September, 1925, under which the date on which each truck reached its destination and the date on which it left its point of origin were recorded. The result was that out of 8,491 wagons 62 per cent. arrived at their destination within 24 hours and only 3 per cent. took more than 72 hours. A large number of individual consignments, i.e. less than a truck load, were also tested, the result being that out of 2,745 consignments 67.5 per cent. arrived within 24 hours and only 2.1 per cent. over 72 hours : in both cases the test was made regardless of distance. The actual economies realised, as a result of amalgamation, by the railway companies up to the end of 1924 were stated by the Rates Tribunal as being equal to £1,450,000 per annum.

As to the difficulties of the railway companies themselves, the question of motor competition will be dealt with later in this chapter.\* The railway companies expressed the view that with prices and wages at their existing level very little further decrease in railway costs could be looked for. They pointed out, however, that the trade of the country is interested in a direct way in the well-being of railway companies, as, if railway expenses go up, the companies can under the Railways Act, 1921, ask for an increase of rates, so that the public are directly interested in seeing that expenses are kept as low as possible. Further, the railway companies stated that if their credit should fail permanently and they became unable to raise money rapidly they would fall behind in efficiency,

\* See pages 223-6

so that traders are directly interested in seeing that the railways are able to give an adequate return to existing shareholders, as otherwise the companies would have to contract their operations in every direction.

The purpose of the present chapter is not to pass a judgment, but to summarise the complaints as to high charges and allegations as to reduced efficiency made in evidence before the Committee on Industry and Trade, and also the replies given to the Committee by the railway companies. As the outstanding change in railway administration since the pre-war period has been the forming of the four large groups out of a number of independent companies, the criticisms centred mainly around the effects of this amalgamation. The grouping, as has been mentioned, has already resulted in a saving of money to the companies ; and even those witnesses who contended that it has not resulted in improved facilities for industry and trade agree that further time is necessary before a final conclusion can be reached as to the success of the amalgamation policy.

### Shipping.

#### *Growth and Development.*

The first steamboat to work for hire in Great Britain was the "Comet" on the Clyde in 1811. The number of steam vessels belonging to the United Kingdom subsequently grew as follows :—

			Number.	Gross Tons.
1820	..	..	34	3,018
1830	..	..	295	30,009
1840	..	..	768	87,539
1849	..	..	1,142	158,729

In 1914 the number of vessels of 100 gross tons and over recorded in Lloyd's Register as belonging to the United Kingdom was about 9,250, aggregating 19,257,000 gross tons, of which only about 650, representing a net tonnage of 365,000 were sailing vessels. In 1927, about 8,500 vessels, aggregating 19,309,000 gross tons, were owned in the United Kingdom, all of which except about 400, aggregating less than 140,000 gross tons, were steamers or motor ships.

The tonnages of the merchant fleets of the United Kingdom and of other countries in 1914 and in the post-war years are given in detail in the Committee's Survey of Shipbuilding. This country's proportion of the world total was 39 per cent. in 1914 and 30 per cent. in 1927 (or 31 per cent. if three million tons be deducted from the world total as representing American tonnage permanently out of commission). As the tonnage owned in the United Kingdom was slightly larger in 1927 than in 1914, the reason for the decline in the proportion owned in the United Kingdom was the increase of the tonnage owned abroad.

The position of British shipping can be summed up in the following manner, the information as to pre-war conditions being derived mainly from the Report of the Joint Committee of the Chamber of Shipping and the Liverpool Steamship Owners' Association published in 1917.

(i) Before the war, British shipowners were carrying practically the whole of the coasting trade of the United Kingdom. This remains the case. Over 99 per cent. of the net tonnage of vessels arriving or departing with cargoes in the coasting trade at ports in the United Kingdom was British in 1924 and in 1925.

(ii) Before the war, British shipowners were carrying 90 per cent. of the trade between the United Kingdom and the Empire and more than one-half the trade between the United Kingdom and foreign countries. No similar post-war figures are available on these points, but, as to trade with the Empire the Chamber of Shipping consider the figure to be less than 90 per cent. As to the net tonnage of vessels engaged in the foreign trade of the United Kingdom, the percentages of British vessels entering and clearing with cargoes at ports in the United Kingdom were :—

	Percentage of British tonnage to total.		
	1913.	1924.	1925.
Entered with cargoes .. ..	65.8	66.6	68.4
Cleared with cargoes .. ..	59.1	63.8	67.4

A similar result is shown if all entrances and clearances, i.e. of vessels with cargoes and in ballast are taken into consideration, the proportion of the British tonnage to the total, both as to entrances and clearances, having been 56 per cent. in 1913, 60 per cent in 1924 and 62 per cent. in 1925.

These figures show that, however the trend of Empire trade and foreign trade has gone individually, British shipowners continue to carry as great, if not a greater, proportion of the overseas trade of the United Kingdom as they did before the war. The comparison is, however, not exact as the trade with the Irish Free State, carried very largely in British vessels, was classed as coasting trade in 1913 and as foreign trade in 1924; but this would not affect the figures very greatly. The conclusion would, of course, be affected if in either year British ships were sailing empty and foreign vessels full, or vice versa, but there is no reason to suppose this to be the case.

(iii) Before the war British shipowners were carrying about half the remaining trade of the world (i.e. trade not touching the United Kingdom). There are no figures available showing the entrances

and clearances of British ships with cargoes at the world's ports under post-war conditions, but, as the gross tonnage owned in the United Kingdom was, broadly speaking, the same in 1914 as it is now, while that of the rest of the world has increased by about thirteen million (after deducting three million for permanently disused American tonnage) since 1914, and as the pre-war proportions of the United Kingdom coasting trade and of the foreign trade of the United Kingdom appear to have been retained by British shipowners, the inference would seem to be that British vessels no longer carry the pre-war proportion of other trade.

This conclusion is borne out by some other figures prepared by the Board of Trade. The records of vessels entered and cleared in foreign trade in the ports of fifty-two of the principal countries in 1913 and 1925 are as follows:—

Nationality of Ships.	Million Tons (net) entered and cleared.	
	1913.	1925.
British .. .. ..	454·6	454·5
National .. .. ..	214·2	266·2
Other .. .. ..	460·0	525·4
Total .. ..	1,128·8	1,246·1

Thus, the British tonnage recorded was the same in 1925 as in 1913, while there was an increase of more than 10 per cent. in the total tonnage handled, so that the British proportion fell from 40·3 per cent. of the whole to 36·5 per cent.

#### *Conditions of Working.*

“ The conditions under which the industry has to sell its product, namely, carrying services, are one sea which in international trade is open to ships of all flags, one international freight market, [British] national ports open to ships under all flags, and no State protection of the industry. It is thus exposed to the free competition of the world.” The Chamber of Shipping in its evidence before the Committee on Industry and Trade described in these terms the conditions under which the British shipping industry operates. There are two main systems under which cargoes are carried—the liner services, and the chartering of “tramps.”

Since 1914 there has been a tendency towards the consolidation of tramp services into cargo liner routes. The growth in importance of the cargo liner group can be shown by accepting the common assumption that tonnage below 5,000 gross tons represents the tramp group, that between 5,000 and 10,000 gross tons the cargo liner

group, and that above 10,000 tons the big passenger liner and large bulk carrier group. The figures are:—

*Gross Tonnage owned in the British Empire.*

Gross Tonnage.	Percentage of Total.		
	1914.	1921.	1924.
Under 5,000 .. ..	64.3	46.7	46.8
5,000 and under 10,000 .. ..	26.0	40.8	39.7
10,000 and above .. ..	9.7	12.5	13.5

A similar increase in the 5,000–10,000-ton group is revealed by the figures of the world total of ships.

The essence of the Liner system is the maintenance on a given route of a regular service of ships sailing on advertised dates, full or not full. The system rests on what are known as "Shipping Conferences," which are, in brief, periodical meetings of representatives of the various lines concerned in each particular trade to discuss matters which affect that trade and to agree upon uniform rates for the various classes of cargo. Each line is free to leave the Conference when it wishes, subject possibly to notice, and new lines can be admitted with the approval of the lines already in the Conference. The advantages claimed for the Conference system are that under it a regular, frequent and efficient service catering for the particular needs of the trade can be provided and further that stability of freights and equality of treatment in the matter of freights for all shippers large and small are secured. In order, however, to maintain a regular service, shipowners claim that it is necessary to ensure the continuous support of the shippers engaged in the trade and thus, so far as possible, to prevent competition by outside ships. In most of the outward trades from this country the shippers are held to the Conference by means of the deferred rebate system.\* In the South African trade, however, the deferred rebate system has been replaced by an agreement between the Conference and the individual shipper, and in the Australian trade the shipper is given the option, as recommended by the Imperial Shipping Committee, between the two systems. In a few outward trades no tie exists. In the homeward trades the application of the deferred rebate system is not so general, and in many trades the volume or type of cargo renders it unnecessary or unsuitable † As to the number of regular liner services from the

\* Under this system, the shipowner allows a rebate on the freight paid during a certain period but the refund is deferred and is made contingent on the shipper continuing to support the Conference during the period of deferment. Thus rebates on freight paid from January to June are only granted in the following January, and the shipper must continue his support in the interim in order to claim them.

† See also "Factors in Industrial and Commercial Efficiency," pp. 87 and 88

United Kingdom to all parts of the world throughout the year, a statement supplied by the Chamber of Shipping showed as many as 564, and this figure (which is not complete) suffices to give some idea of the regularity of the services offered by the Conferences. The Conference system has been criticised by traders on the ground that cases have arisen where lower rates are quoted, even by British ships, from continental ports than from the United Kingdom and that this has tended to divert trade from this country. Further, they point out that, if they were permitted to do so, they could at times obtain a through rate, which would be cheaper than the direct rate from this country, by sending their goods to continental ports for trans-shipment. The shipowners agree that such cases may occur, particularly when a currency is depreciated. They point out that the object of a Conference is always to secure a parity of rates at British and continental ports and that in some cases this has been achieved. Disputes within a Conference or competition from outside may, however, result in very low rates ruling from certain continental ports. Should this occur, the British liner companies have to decide whether to quote level rates with the continental lines and, possibly, to face a heavy loss, or to give up their position in the continental trade, with the consequence that more ships have to be laid up. The shipowners state that if such a situation arises, their object always is to reach agreement in Conference.

The main features of the "tramp" system are that, unlike the liners, the tramp has no fixed itinerary and only sails if she has a cargo to carry on in prospect. The shipper, or shippers, charter a vessel which will go from any part of the world to any other part as required, but she does not normally take cargo in parcels, as the liners do, but deals almost entirely with full cargoes. London is the centre of the chartering trade of the world, every charterer and practically every shipowner having representatives in London between whom the bargain is made. The tramp rate, however, is international, i.e. the same rate is paid for a ship of equal class sailing under any flag, the shipper of the cargo being quite unconcerned as to the flag he ships under and only interested in getting the lowest possible freight in a world market. Roughly speaking, tramp steamers may be divided into three groups—small steamers up to 3,000 tons dead weight, employed in the coasting trade or the near continental trade; rather larger steamers up to about 5,000 tons dead weight, employed in such trades as those with the Lower Mediterranean, and larger steamers up to as much as 12,000 tons dead weight engaged in the world trade. The conditions governing the employment of each of these groups are the same: the employment of tramps is confined to the shipment of goods which can be dealt with in large quantities and can be shipped in full cargoes, e.g. coal, grain, ore, sugar, timber, rice, fruit, heavy chemicals, etc.

*Efficiency of Working.*

As to the efficiency of the services provided, this can be measured—

- (a) by the age and quality of the ships ;
- (b) by their immunity from accident ; and
- (c) by the care with which the industry carries and delivers its cargoes.

As to the age of the ships, in 1924 of the total British tonnage 26 per cent. was under 5 years old, 48 per cent. under 10 years old, and 81½ per cent. under 20 years old. Only 8½ per cent. was 25 years old or more. For purposes of comparison it may be mentioned that, if British and United States tonnage is excluded, nearly 30 per cent. of the world tonnage is 20 years old, and over 18 per cent. is 25 years old or more. As to the type of vessel, there are two tendencies which require mention : the steady elimination of the sailing ship and the coming of the motor vessel. As to the former, 10 per cent. of the total world tonnage of sailing vessels (100 gross tons and over) was owned in the United Kingdom in 1914 and only 6 per cent. in 1925, a fact which indicates that the United Kingdom is abandoning the sailing vessel more rapidly than is the rest of the world. As to motor vessels, an aggregate of 136,807 gross tons, representing 15 per cent. of the total world tonnage of motor vessels, were owned in the United Kingdom in July, 1920, and by July, 1927, there had been an increase to 1,183,131 gross tons representing 28 per cent. of the total world tonnage of motor vessels. As to immunity from accident and the care of cargo, the insurance rates quoted for the same marine risks at the present time are no higher than in 1914, and, generally speaking, claims in respect of damage to cargo have been for a number of years gradually diminishing both in number and amount.

From the foregoing brief account it seems safe to conclude that Great Britain, upon the whole, retains her position of pre-eminence as the ocean carrier of the world. In their evidence before the Committee on Industry and Trade, the Chamber of Shipping expressed the view that certain things are essential if this is to continue. In order that the mercantile marine can continue its services to overseas trade, an increase in the volume of overseas trade, and in particular of the export trade of the United Kingdom, is required. It is essential that British shipping should be able to give better service at less cost than the ships of other countries, and restrictive regulations by Government, e.g. as to safety, etc., in excess of those operating upon vessels of competing nations should be abolished as far as possible. Further, every step possible should be taken to abolish flag discrimination in the carriage of cargoes or passengers, and to secure exemption from double taxation. The view of the Chamber of Shipping is that ocean freights have been reduced to a minimum and are not now a substantial item in the cost at which

manufacturers' articles are sold, but that there has been no corresponding reduction in the other items which go to make up the total cost of transport from producer to consumer. In particular, the Chamber hold, every effort should be made to reduce costs at the ports and on the railways in order to reduce prices of British exports to the foreign consumer and thus provide better outward cargoes for British ships.

### Road Transport.

#### *Growth and Development.*

The roads represent the oldest artificial transport facility, and it is a singular fact that they were no better in the eighteenth century than they were in the days of the Roman occupation. There were, perhaps, more roads at the later of these dates, but the Roman roads had suffered from centuries of decay. In consequence, the roads were barely passable. Arthur Young's description (circa 1770) of the main road between Preston and Wigan—"I know not, in the whole range of language, terms sufficiently expressive to describe this infernal road . . . . . ruts four feet deep and floating with mud, only from a wet summer"—is famous, but that it did not refer to conditions exceptional at that time is shown by such an example as that, in the middle of the eighteenth century, the London-Oxford coach started its journey of under 60 miles at 7 a.m. and did not reach its destination until the evening of the following day, halting for the night at High Wycombe. The application of Macadam's process of road-making between 1790 and 1830 and the contemporary construction of many new roads, together with an improvement of vehicles, brought about so great a change that by the middle of the nineteenth century the rate of travelling on the turnpike roads was something like 10 miles an hour. About that date road transport, except for very short or remote journeys, was replaced by the railways and the roads lost their importance for industrial purposes until the motor-car came into general use in the present century.

In 1818, a Select Committee on Turnpike Roads and Highways estimated that there were about 115,000 miles of highways in England and Wales, of which nearly 20,000 miles were paved streets and turnpike roads; and in 1829, a House of Lords Committee on Turnpike Trusts estimated the extent of turnpike roads in Great Britain as 24,500 miles. In 1926, the Ministry of Transport figures were.—

	<i>Miles.</i>
Class I roads ..	24,552
Class II roads ..	15,625
Other roads ..	138,185
Total ..	178,362

Thus, while the length of classified roads is nearly twice the length of railway, there are, if all roads be included, 9 miles of road to every one mile of railway, 2 miles of road to every square mile, and 1 mile of road to every 250 inhabitants. Large schemes of new road construction and of improvements to existing roads are now being carried out to meet the growth of motor traffic.

The roads began to regain their importance with the invention and steady improvement of the motor vehicle. In 1913, there were about 100,000 private motor-cars and 40,000 motor hackneys in Great Britain. As commercial vehicles were not licensed until 1922, it is not possible to state their number before the war. They were not, however, then used on a scale at all comparable to the present.

The following table shows the increase in the number of licenses current in Great Britain between August, 1922, and August, 1927:—

Date.	Cars taxed on horse-power.*	Commercial Goods Vehicles.	Motor Hackneys.	All motor licenses.†
August, 1922 ..	314,769	150,995	77,614	975,783
August, 1927 ..	778,056	274,651	95,676	1,888,726

\* These may be taken, roughly, to represent privately-owned motor cars.

† Including, in addition to the categories named, motor cycles, agricultural, and other mechanically propelled vehicles.

The figures of imports and production of motor-spirit give a further indication of the growth of motor transport. In 1914, the retained imports amounted to 119 million gallons and the home production was negligible. In 1926, the retained imports were 543 million gallons, and, in addition, there were retained 133 million gallons produced in this country mostly from imported petroleum but partly from native petroleum and shale, a total of 676 million gallons retained for consumption—more than five and a half times the 1914 figure.

As to the number of motor vehicles in other countries, the following estimate of the numbers of passenger cars, made in 1925 by the National Automobile Chamber of Commerce, New York, gives some indication of the comparative position:—

U.S.A. ..	15,598,000	cars,* or one to every 7 inhabitants.
United Kingdom ..	568,000	„ „ „ 76 „
France ..	460,000	„ „ „ 85 „
Germany ..	154,000	„ „ „ 390 „
Italy ..	65,000	„ „ „ 600 „
Belgium ..	58,000	„ „ „ 129 „

\*At the beginning of 1927 the number of motor vehicles registered in the U.S.A. had grown to 22,137,000

The same authority gives the number of commercial vehicles in U.S.A. in 1925 as 2,143,000, or about ten times as many as in Great Britain at that date. No details are available as to the number of commercial vehicles in other countries.

In comparing the number of motor vehicles, particularly passenger cars, in different countries, it is important to bear in mind that the development of the motor cycle has been carried in Great Britain to a much greater length than elsewhere, especially the motor-cycle with the attachment of a side-car. There were 671,620 motor-cycle licences current in Great Britain in August, 1927.

#### *Conditions of Working.*

There are no general restrictions in regard to the ownership of motor vehicles, it being open to anyone to purchase and run a motor-car or commercial vehicle. The only exception to this is that a special licence has to be obtained for a hackney carriage, and in order to obtain such a license the vehicle has to be shown to be suitable for the purpose from the point of view of safety of the passengers. Possibly owing to this lack of restriction and the comparative cheapness of the vehicles, road transport is not concentrated into large concerns like the amalgamated railway companies or some of the great steamship companies. There is a tendency towards combination in connexion with omnibus services, but there remain numerous small owners. In the goods-carrying services, however, the tendency is much less marked. There are certain large firms of haulage contractors, but that they are the exception can be seen from the fact that the average number of vehicles owned by the members of the Commercial Motor Users' Association is about five. A large part of road transport is carried on in vehicles belonging to the concerns whose products they are carrying, two-thirds of the vehicles owned by members of the Association just mentioned belonging to concerns who do their own transport only. The absence of large amalgamations of road carriers may to some extent be accounted for by the difficulty of the problem of return loads. How serious this is an element in cost may be judged by the fact that the average loading in road transport work at large is below 50 per cent. Various efforts to solve the problem have been made by means of a freight exchange and publicity in the newspapers, but they have been unsuccessful. In specialised trades, e.g. in the cotton industry where firms send lorries to Manchester with manufactured goods to return with yarn or raw cotton, the difficulty can be solved and a service running to a time schedule instituted by the Nottingham Chamber of Commerce in 1919, is stated to have raised its figure of average loading to as high a figure as 80 per cent. by arranging in advance definite loads forward and back. Attempts to cover the whole country, however, have never succeeded.

In considering the conditions under which the road transport industry works, there are two other important factors which require mention, the protection given to the production of motor vehicles and the utilisation of motor taxation for the purpose of providing and maintaining roads. As to the former, an *ad valorem* import duty of 33½ per cent. was imposed upon motor vehicles, with the exception of commercial vehicles, in 1915. The duty was allowed to lapse in 1924, but was reimposed in 1925 and remains in force. Further, in 1926 the duty was extended to cover commercial vehicles as well. In regard to the Road Fund, all motor vehicles are taxed (private cars according to horse-power, commercial vehicles on laden weight, and hackneys on seating capacity), and the yield is paid into a special Road Fund administered by the Ministry of Transport. The bulk of this fund has been expended in the form of grants to highway authorities towards the cost of maintaining and improving roads and in the construction of new roads. During the year 1926-27, the amount available for grants was approximately £18 millions.

#### *Efficiency of Working.*

The industry being of such recent growth as compared with the railways and shipping, it is difficult to estimate its efficiency. The improvement which has constantly been taking place in the construction of the actual vehicles is a matter of common knowledge and may be reflected in the steady growth of the exports of British motor vehicles since the end of the war. The efficiency of the service rendered is, however, quite impossible to measure. It is only possible to mention the great increase in the number of vehicles in use and the fact that a number of industries, e.g., the cotton and woollen and worsted industries, are known to be making increased use of road transport, as indications that road transport is becoming of great practical use. Some light may be thrown on the matter by considering the position as to competition between the three main types of transport.

#### **Competition between Rail, Road, and Coastwise Shipping.**

*Competition Between Rail and Road.*—The competition of road transport is stated by the railway companies to have become in the last few years a very serious matter for them, both as regards passengers and goods. No definite estimate as to the extent to which it has affected the railway companies can be made, but it has been stated to affect their revenue to the amount of several million pounds annually. Road competition is affecting the railways particularly seriously in industrial districts, and especially in the South Lancashire area. The railway companies contend that not only is this competition serious, but that it is being conducted on uneconomic lines, as the railway companies have to bear the whole

cost of their own permanent-way and, in addition, have to contribute largely as ratepayers to provide the permanent way for their competitors on the roads. Their case is that the heavy commercial vehicles, in spite of the increased scale of licence duties imposed by the Finance Act of 1926 do not pay a share equal to the wear and tear they inflict on the roads, the balance falling in part on the light motor car and to a still greater extent on the general ratepayer, including, of course, the railway companies. In the result, the railway companies hold, not only are their revenues being adversely affected, but traffic is being diverted to the roads which as far as the advantage of the community is concerned could more economically be carried by the railways.

With this view the road transport interests do not agree, contending that the railway companies are under a misapprehension as to the extent of the influence of road transport on their revenue. It is admitted that in certain districts, such as South Lancashire, and in certain instances of omnibus competition, a considerable volume of traffic formerly conveyed by rail is now passing by road, but it is argued that, if railway traffic is visualised as a whole, the figures of tonnage carried indicate that the difficulties of the companies are due very largely to the reduction in mineral traffic,\* which is admittedly unsuitable for road carriage, rather than to a falling-off in merchandise traffic.† Against the volume of traffic carried on the roads, it is argued, must be set the growing volume of road material conveyed by rail (7 million tons in 1920 and 12½ million tons in 1925), the traffic carried by rail to and from motor factories, and the influence of road transport upon building and agriculture, all of which tend to increase the traffic in goods or passengers carried by rail. In regard to the alleged uneconomic nature of road competition, the road transport interests contend that the highway rates paid by the railway companies represent under one-fiftieth of a penny per ton mile of all traffic conveyed by freight train, and that, so far from it being the case that the railways pay for the increased highway maintenance costs, the large payments from the Road Fund to Highway Authorities in fact relieve the rates. As to the contention that the heavy vehicle does not pay its share of the cost of the road, the road transport interests admit that the heavy vehicle does serious damage to weak roads. The remedy, they consider, lies in keeping heavy vehicles off very weak roads, and in increasing grants for strengthening such roads. As to the suggestion that the community suffers on account of what should be rail traffic being carried on the roads, the road transport interests contend that

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\* The fall in the Coal, Coke, Patent Fuel and other minerals group was from 297 million in 1913 to 275 million tons in 1924 and 256 million tons in 1925.

† The fall was from 68 million tons in 1913 to 61 million tons in 1924, and 60 million tons in 1925.

they are giving a different service, not a railway service. Attempts have been made to come to some arrangement for co-operation between the railway companies and the road transport interests, but so far without success.

There is one further aspect of this subject which requires mention, and that is the powers of the railway companies themselves to engage in road carrying operations. At present all the railways have power to carry traffic by road to and from their stations, i.e. to distribute and collect traffic which has passed or is destined to pass by rail. Some railways have powers to carry traffic independently of the railway altogether, but others have no such powers, and a Bill promoted by the London and North Western and the Midland Companies in 1922 with the object of obtaining powers to carry traffic by road within the areas served by their respective lines was ultimately withdrawn by the promoters.\* According to the evidence before the Committee on Industry and Trade, the automobile manufacturers upon the whole favour the railway companies being permitted to engage in road transport, but the concerns operating road transport are, in general, opposed to such a development.

*Competition between Rail and Coastwise Shipping.*—A form of domestic transport which has not greatly developed in recent times is coastwise shipping. In the middle of the 19th century the entrances in the coasting trade of Great Britain represented approximately  $10\frac{1}{2}$  million net tons, while the average annual entrances with cargoes for the period 1910–13 were about  $32\frac{1}{2}$  million net tons. A comparison with the present time is vitiated by the fact that trade with the Irish Free State previously classed as coasting trade is now classed as foreign trade, but in 1925 the entrances with cargoes in the coasting trade of Great Britain represented about  $20\frac{1}{2}$  million net tons. When compared with the figures already given in this Chapter in regard to the shipping engaged in the foreign trade and in regard to railway traffic, this figure is trivial. The reason is that the traffic the ports might have handled has gone to the railways, who sometimes quote special rates to meet coastwise competition. The shipowners argue that the other customers of the railways have to pay for these cut rates, but the railways reply that the practice is to the advantage of the community, as such rates cover the cost of conveying the traffic and leave a balance towards overhead charges, which would otherwise have to be borne in their entirety by the railway companies' other customers. Further,

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\* During the session of Parliament which opened in February, 1928, the various Companies introduced Bills in which they seek general powers to act as road carriers and to own and operate road vehicles. These powers are being opposed by the road transport interests, and the proposals have also been criticised by other bodies and individuals who fear that, if such powers are given to the railway companies, the risk of a transport monopoly will be increased.

they point out that coastwise freights are lower than railway rates. As to the future, the shipping interests suggest that the improvement in road transport will enable the smaller ports to develop and provide an additional transport facility in view of the large proportion of the population living near to ports and the coast. The railway companies agree that the introduction of road transport has, from their point of view, made every point competitive.

It has been explained above, but should be repeated here, that the purpose of this chapter is not to pass a judgment. Consequently, the object of this section is merely to summarise broadly the differences of opinion which exist, and have been explained to the Committee, as to the most suitable policy to adopt in order to obtain the best results from the various forms of transport facility available.

### Other Transport Facilities.

There are two other forms of transport which may be shortly mentioned, the canal system and civil aviation. The canals in Great Britain were largely constructed in the second half of the 18th and in the early years of the 19th century; and until the advent of railways were extremely prosperous. There are now 3,825 miles of canals and canalised rivers in Great Britain. Some of the canals are still remunerative concerns, such as the Aire and Calder between Leeds and the Humber, and the Trent Navigation between Nottingham and the Humber. The railway companies, however, who own or control over a quarter of the mileage, do not consider that there is a prosperous future for canals, even in subordination to the railways. In particular, they do not think that the scheme, put forward by a Royal Commission in 1909, for connecting the Thames and the Mersey, and the Humber and the Severn, with a centre in the Midlands would pay. In certain other countries greater use is made of navigable waterways than is done in Great Britain, there being 32,600 miles in the U.S.A., 7,600 miles in Germany, and 6,600 miles in France.

Civil aviation was commenced in August, 1919, and the industry is in receipt of a subsidy from the Government, which in 1924-25 amounted to £138,500. In 1925, 2,891 flights were made by British aircraft between the United Kingdom and abroad, carrying some 10,600 passengers. British aircraft on regular routes at home and abroad in 1925 carried 14,068 passengers, and 455 tons of goods. These figures show that aviation, whatever its future may be, has not yet become a serious competitor with other forms of transport.

### Port and Dock Facilities.

It has been shown in the course of this chapter that Great Britain possesses a large number of ports and that these are exceptionally well placed in relation to the great groups of population when compared with those of other industrial countries, and that

they are served by extensive transport systems both on sea and land. It is, nevertheless, obvious that however numerous and suitably placed the ports may be, and however extensive the transport systems serving them, trade will not flourish if the ports are not efficiently conducted. It will, accordingly, be the final object of this memorandum to examine the available evidence in regard to the efficiency of the ports and docks.

The evidence given to the Committee on Industry and Trade shows that there is a considerable volume of complaint by manufacturers, traders and shipowners, as to both the speed and the cost of handling the ships and their cargoes.

As to the speed of handling, it is contended that there is from time to time very serious congestion and delay, particularly in regard to the country's principal bulk export, coal. Supposing these complaints to be justified and that the conditions complained of are not unavoidable, the lack of speed must be due either to defective management, defective appliances and lay-out, or to inefficiency or bad organisation of labour. All these have, in fact, been blamed. It has, for example, been suggested that the arrangements for bringing coal to the ships and the loading appliances provided are defective, while various detailed criticisms have been made in respect of certain ports as to the lay-out of railway lines, the design of port entrances and docks, the types of hoists and conveyers, etc. Complaints also are made in regard to labour arrangements. As an example, shipowners lay stress upon the difficulties in connection with the coal trimmers, the men employed to trim the coal placed in the holds or bunkers of vessels so that it is safely and economically stowed. No complaint is made of the efficiency of the work done ; but the complaint has two sides, one as to hours and the other as to wages. In regard to hours, the coal trimmers before the war at busy ports worked in turns which covered both day and night. Since the war this has not been the case. Various agreements have been made in the different areas, e.g. the North-East Coast, the Humber, the Bristol Channel, and South Wales ; and the provisions of these agreements differ from area to area in regard to the working of overtime and of extra hours to facilitate the despatch of vessels. The abolition of night shift working is, however, common throughout the country except at two staiths on the Tyne and on the Bristol Channel, where special arrangements have been made enabling a night shift to be worked under certain conditions. The shipowners in their evidence before the Committee on Industry and Trade stated that this rearrangement of hours as compared with those worked before the war had led to a great increase in the length of time taken both in bunkering and loading vessels. As to wages, there were before the war different agreements in operation in the various main coaling areas, but in August, 1920, a " National Tariff " was agreed upon. This entailed

a great increase over pre-war rates as it represented in most cases a small increase over the 1919 rates, which were themselves considerably more than double the 1914 rates. At the same time a National Joint Trimming Committee, containing representatives of the ship-owners and the trimmers, was established to decide all questions arising under the tariff. The tariff has been the subject of various negotiations and amendments since its adoption, and in July, 1925, when the shipowners complained of it to the Committee on Industry and Trade, it stood at 33½ per cent. below the level of August, 1920. The representatives of the shipowners before the Committee not only contended that this level was too high, but complained that the tariff was based upon the assumption that a ship occupying a loading or bunkering berth must pay the trimmers even though no work was done by them, the trimmer being paid for all coal put on board a vessel whether it involved trimming labour or not. While admitting that the rates varied according to the type of vessel and the part of the vessel in which the coal was loaded, they maintained that more advantageous rates for vessels in which the work was comparatively easy would encourage the further construction of improved types of vessels and the employment of improved mechanical means of loading. In reply to these contentions, the representatives of the trimmers, it is understood, point out that they have no guarantee as to payment, except for actual work done, and that the payment under the tariff is on a piecework basis. As to the question of "easy-trimmers" and of improved mechanical devices, it is pointed out that the employers by their introduction receive an advantage in the way of early despatch, and that what may appear to be high rates for easy work only compensate the trimmers for what they regard as very low rates for exceedingly arduous work on vessels not specially constructed for coal carrying. As has been said, this question of the coal trimmers is mentioned as an example of the difficulties which exist ; and for the purposes of this Chapter it will be sufficient to record that, in consequence of a disagreement on the National Joint Trimming Committee, a Court of Investigation (under the Conciliation Act, 1896), was set up by the Minister of Labour in September, 1926, and that the report of the Chairman of the Court stated that, as a whole, the tariff was working satisfactorily and was being operated with good will on both sides. As a result of recommendations in this report, a reduction in the general tariff rates to 40 per cent. below the level of August, 1920, was adopted, together with certain modifications estimated to involve a further reduction of from 1½ to 2½ per cent. on tariff rates. As regards ordinary dock labour there is some complaint as to the effect of the 8-hour day on costs and speed of handling, but the principal difficulty in regard to general dock labour is the question of decasualization.\*

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\* See "Survey of Industrial Relations" pp 161-171.

While these complaints are made, it is noteworthy that a body, known as the Port Facilities Committee, was appointed in the autumn of 1923 by the Chamber of Shipping. This Committee on which a number of shipowners and representatives of the Federation of British Industries and of the Association of British Chambers of Commerce served, made a series of detailed inspections of British ports. Its report, published in May, 1924, contained a review of the position in thirty individual ports and made numerous detailed suggestions for their improvement. The principal conclusions arrived at were that in certain ports the handling of railway traffic is impeded by "bottle necks," that in many instances port entrances and locks require improvement, that at certain ports new docks and quays and increased area of existing docks and quays are required, that at some ports parts of the system of docks and discharging berths are obsolete by reason of the increased size of modern steamers, and that various improved discharging methods should be installed. The Committee stated that ready and sympathetic consideration was given by port authorities to their recommendations; and, bearing in mind the detrimental effect of four years of war and five years of difficult post-war conditions, they concluded that, generally speaking, the port authorities are alive to the need for developing their ports. The report stated that in many cases schemes of improvement were actually being proceeded with and others were in contemplation, and that the spirit animating the port authorities augured well for future development. As to the position in regard to labour, the Committee considered that much good would result if local port committees co-opted representatives of labour to co-operate with them. In their evidence to the Committee on Industry and Trade the Chamber of Shipping expressed the view that this report has shown that, taking all things into consideration, British ports have kept pace with modern improvements in processes, i.e. methods of handling and storage, but that there is need for improvement in many ports.

Turning to the question of costs, there are two main aspects of the problem—the dues and charges levied by the port authorities on vessels and cargoes using the ports, and the charges for loading and discharging which in the majority of cases are outside the control of the port authorities.\* The shipowners point out that high costs at British ports are directly injurious to overseas trade and that every effort should therefore be made to reduce them. They also point out, however, that the cost of handling is far more serious than the actual dock and harbour dues; and an example provided in the report of the Port Facilities Committee (pp.277-281) showed that, taking round figures, the cargo costs in 1924 at United

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\* See the section of Chapter VIII dealing with Dock and Harbour Administration; pages 333-343, and, in particular, pages 339-341.

Kingdom ports were three shillings a ton, of which one shilling represented pilotage, towage, lights and dues, and two shillings represented discharging and tallying.

The Port Facilities Committee was concerned simply with questions of equipment and efficiency of working. Another body, known as the Co-ordinating Committee on Dock Charges, was organised at the end of 1921 in regard to the other subject of complaint, charges. This Committee, on which twenty-five organisations of shipowners and traders were represented, had as its object "the securing of reductions in cost and charges at British ports," and its executive committee issued in October, 1926, a report on port costs with special reference to costs of loading and discharging. This report, having drawn attention to the increased and increasing prosperity of certain continental ports, e.g. Antwerp, Hamburg, Rotterdam, attributed it to improved equipment and lower costs, as compared with British ports. Having referred to the work of the Port Facilities Committee with regard to equipment, the report proceeded to deal with the subject of costs. As to port dues, it stated that negotiations between the Committee and the Port Authorities had resulted in substantial reductions in charges and the view was expressed that these charges had been reduced to the minimum which existing conditions permitted. The Report, however, recorded a different conclusion in regard to costs of loading and discharging. Instances were quoted to show that, with the exception of Rotterdam, costs at continental ports showed little or no increase over pre-war and were in some cases lower, while at British ports they ranged from about 50 per cent. to more than 100 per cent. above pre-war. Examples were also given of delays in handling at British ports and references made to their effect. The report concluded with the suggestion that a complete investigation should be made into the higher costs and diminished services at British ports as compared with continental ports in order that remedies may be found and applied.

**CHAPTER V.**  
**ASPECTS OF INDUSTRIAL MOBILITY.**

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## ASPECTS OF INDUSTRIAL MOBILITY.

**Employment in the Principal Exporting Industries in Great Britain, 1901-27.***Numbers in the principal exporting industries, 1901-27*

Owing to changes in classification which have been made from time to time in connexion with the taking of the Census of Population, and also in connexion with the recording of particulars of persons insured under the Unemployment Insurance Acts, it is not possible to measure accurately the numbers of persons in the exporting group of industries at different periods. The changes made in connection with the Census of Population and the differences in presentation of results by the Census Authorities of England and Wales and of Scotland are explained in Chapter I of the "Survey of Industrial Relations"; and an important difference is referred to in the Note to Table 7 below. It is, however, possible to get some approximate figures of the rate at which the numbers in the exporting group of industries were changing in various periods, and some figures as to this will be found in Tables 7 and 1 (pp. 253 and 244). It will be noticed at once that the groups given in the two tables do not tally, and great care should, therefore, be taken not to compare the figures given in the one table with those in the other.

The first three columns of Table 7 indicate that the numbers engaged in Great Britain in the exporting group of industries dealt with increased during the decade 1901-11 by, approximately, 20 per cent., while the total occupied population increased during the same period by 12.5 per cent. Hence the numbers in the exporting group as a whole were increasing faster than the total occupied population. It will be noticed that the largest increases were shown in coal mining and in the metal industries, and that the only decreases were in the silk and the boot and shoe industries.

The last three columns of Table 7 indicate that during the decade 1911-21 the numbers engaged in Great Britain in the same group of "exporting" industries increased by over 20 per cent., while in the same period the total occupied population increased by 5.5 per cent. It must be remembered, however, that the decade included the war years during which the exceptional home demands on the munition-producing trades (and not the requirements of overseas markets) were the governing factor in the growth of the numbers engaged in the metal industries, in which the increase was greatest. In coal-mining the increase was due neither to the exceptional home demand nor to the requirements of oversea markets; it occurred in the year 1919 when nearly 200,000 workers in coal mines were added although both the total output and exports in both 1918 and 1919 were substantially below the figures for the year 1911.

The only decreases of any magnitude were shown in the cotton and the boot and shoe industries. Owing to a change in the method of classification (explained in the Note below Table 7) no direct comparison can be made between 1901 and 1921.

There having been no Census since 1921, no later figures can be given on the foregoing basis. The best available test is to take the estimated number of persons insured under the Unemployment Insurance Acts, and the figures are given in Table 1. The groups given are not identical with those given in Table 7, and the figures relate only to insured persons and not to all persons engaged in the various industries, as in the case in Table 7. While there are these important differences between the bases of the two sets of statistics the figures are sufficient to reveal a highly important difference between the tendency noticeable in the decade 1901-11 and that to be observed in the period 1923-27. Table 1 shows that the estimated numbers of insured persons in the exporting groups of industries dealt with decreased between July, 1923, and July, 1927, by 1.4 per cent., while the numbers of persons in all other insured industries increased by over 10 per cent., and the numbers in the insured industries as a whole increased by nearly 6 per cent. Thus, the drift towards the exporting group of industries was non-existent during the period. Marked increases can be noted in the following groups:—Motors and other vehicles, electrical cables and lamps, electrical engineering, and silk; and heavy decreases are shown for general engineering, shipbuilding, coal mining, and steel smelting.

Table 4 (page 250) shows how the tendency in certain non-exporting industries and services differed in the period 1923-27 from that seen in the exporting group of industries. The numbers insured in the industries and services shown in Table 4 increased during the period by 16 per cent.

These figures are sufficient to indicate that the exporting group of industries as a whole was being recruited faster than industry as a whole in the decade 1901-11 and, for special reasons, very much faster in the decade 1911-21, but that since 1923 the tendency has changed, the number in the exporting group of industries as a whole having actually decreased. In other words, the proportion of the total occupied population which was engaged in the exporting group of industries was rising from 1901-21, but has since been falling.

*Unemployment in the principal exporting industries, 1923-27.*

Comprehensive and comparable statistics of unemployment industry by industry are not available for dates prior to June, 1923.\* Subsequent to that date, however, figures are available for each month of the numbers and percentages of unemployed among persons insured under the Unemployment Insurance Acts. In the

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\* See "Survey of Industrial Relations," pp. 220 et seq.

under-mentioned tables these figures are given for the end of June and December, 1923-27.

Table 2 shows the numbers unemployed in Great Britain in the groups of exporting industries considered in dealing with the numbers of insured persons in those industries (p. 246).

Table 3 shows the percentages unemployed in this group (p. 248).

Table 5 shows the numbers unemployed in Great Britain in the group of non-exporting industries and services considered in dealing with the numbers of insured persons in those industries (p. 251).

Table 6 shows the percentages unemployed in this group (p. 252).

The figures indicate that, throughout the four-year period covered, the percentage of unemployment in the exporting group as a whole has always been higher than that for the other insured industries, the average of the percentages for the ten dates shown in Table 3 being 13.3 per cent. for the exporting groups and 9.1 per cent. for the other insured industries, as compared with an average of 10.8 per cent. for the insured industries as a whole.

### Geographical Distribution of the Industrial Population and of Unemployment, 1923-27.

In the preceding paragraphs some data were given as to (i) the changes in the numbers in the principal exporting groups of industries as compared with the changes in total occupied population or in the total number of persons insured under the Unemployment Insurance Acts, and (ii) the numbers unemployed in the exporting groups as compared with the number unemployed in other industries and the total number unemployed.

Another gradual change to be observed affects the geographical distribution of the industrial population. The next purpose of this chapter is to give some figures as to the extent of this change during the years 1923-27\* and as to the contemporary differences in the level of unemployment in various parts of the country.

#### *Geographical distribution of insured persons.*

For purposes of administration of the Unemployment Insurance Acts, Great Britain is divided into eight divisions with Northern Ireland forming a separate area. The portion of the country formed by each division is broadly indicated by its title, but it may be explained that the London division includes Greater London and that the south-eastern division includes, roughly, the area lying east of a line drawn from the Wash to Portsmouth (excluding, of course, London). The following figures† show the estimated number of

\* For more detailed information see the "Ministry of Labour Gazette," November, 1927.

† The figures are exclusive of persons insured under the Special Schemes for the Banking and Insurance industries, for which a geographical analysis is not available.

insured persons in each of these divisions in July, 1923, and July, 1927; the percentage of the total formed by the number in each division at each of these dates; and the percentage increase in each division during the period:—

	Estimated Number of Insured Persons.		Percentage of Total.		Increase 1923-27.	
	July, 1923	July, 1927.	July, 1923.	July, 1927.	Number.	Per cent.
London .. ..	2,004,000	2,150,000	17.6	17.9	146,000	7.29
South-Eastern ..	756,000	876,000	6.6	7.3	120,000	15.83
South-Western ..	767,000	833,000	6.7	6.9	66,000	8.60
Midlands ..	1,682,000	1,783,000	14.8	14.9	101,000	6.03
North-Eastern ..	1,964,000	2,025,000	17.2	16.9	61,000	3.09
North-Western ..	2,071,000	2,148,000	18.2	17.9	77,000	3.73
Wales .. ..	618,000	629,000	5.4	5.2	11,000	1.81
Scotland .. ..	1,288,000	1,306,000	11.3	10.9	18,000	1.38
Northern Ireland	252,800	254,000	2.2	2.1	1,200	0.47
Total .. ..	11,402,800	12,004,000	100.0	100.0	601,200	5.27

These figures reveal the markedly greater increase in the south than in the north. The southern section of the country (i.e. the London, south-eastern, south-western, and midland divisions, the latter reaching as far north, broadly, as the southern borders of Cheshire, Yorkshire and Lincolnshire) included 45.7 per cent. of the insured population in 1923, and the figure had risen to 47 per cent. in 1927. Out of the total increase of 601,200 insured persons in the four years, the south claimed 433,000, or 72 per cent. The increase in the southern section was 8.3 per cent., and in the northern section only 2.7 per cent., as compared with an increase of 5.3 per cent. in the country as a whole.

Individually each of the southern divisions contained a larger proportion of the insured population in 1927 than it did in 1923, and each of the northern divisions included a lower proportion in the later year than it did in the earlier. The largest numerical increase was in London, but the most striking rate of increase was in the south-eastern division. The increase in the number of insured persons in these two divisions was 266,000, or 44 per cent. of the total increase in the whole country; and the two divisions now include 25.2 per cent. of the total insured population as compared with 24.2 per cent. in 1923. Numerous industries have been involved in the change; and the figures in the three following tables give some particulars of the geographical changes in a number of important industries, in which the disparity between the rate of growth or contraction in the southern and northern sections of the country respectively has been most pronounced. Regard is only had to industries in which there are at least 20,000 insured persons.

*Sections of industry in which there has been growth in the south, but decline in the north.*

Industry.	Southern Section.		Northern Section.	
	Increase 1923-27.		Decrease 1923-27.	
	Numbers.	Per cent.	Numbers	Per cent.
Stove, Grate, Pipe, etc., and General Iron Founding	+4,460	+10.5	— 240	— 0.6
Oil, Grease, Glue, Soap, Ink, Match, etc., Manufacture	+4,370	+15.7	—3,360	— 6.6
Carpet Manufacture .. ..	+ 120	+ 1.3	—1,050	— 6.5
Hat and Cap Manufacture .. ..	+1,040	+ 5.3	—2,260	—14.9
Dressmaking and Millinery .. ..	+ 550	+ 0.7	—9,500	—27.5

*Sections of industry in which there has been a greater growth in the south than in the north.*

Industry.	Southern Section.		Northern Section.	
	Increase 1923-27.		Increase 1923-27.	
	Numbers.	Per cent	Numbers.	Per cent.
Musical Instrument Making ..	4,930	28.1	90	4.2
Constructional Engineering ..	2,590	30.3	1,080	7.1
Bleaching, Dyeing and Finishing, etc.	2,190	14.5	1,990	2.2
Furniture Making, etc. .. ..	15,550	24.9	4,350	14.2
Construction and repair of Motor Vehicles, Cycles and Aircraft	32,160	20.8	5,790	15.1
Stone Quarrying and Mining ..	4,440	36.6	5,990	31.0
Brick, Pipe, Tile, etc., Cement and Artificial Stone and Concrete Manufacture	21,810	41.4	12,650	36.0
Railway Carriage, Wagon, and Tramcar Building	2,850	10.7	1,490	6.0
Iron and Steel Tube Making ..	1,820	12.9	950	8.5
Distributive Trades .. ..	180,910	26.5	127,610	22.8
Silk (including Artificial Silk) ..	10,210	45.7	6,690	42.4
Electrical Engineering .. ..	10,660	28.0	6,220	25.9
Tailoring .. .. ..	7,990	9.2	6,820	7.2
Drink Industries .. .. ..	6,090	10.2	3,310	8.2
Hosiery .. .. .. ..	8,060	11.4	1,900	9.6

*Industries in which there has been a less rapid decline in the south than in the north.*

Industry.	Southern Section.		Northern Section.	
	Decrease 1923-27		Decrease 1923-27	
	Numbers.	Per cent.	Numbers.	Per cent.
Construction and repair of Carriages, Carts, etc.	4,490	24.9	2,570	26.8
Paper and Paper-Board Making	350	1.4	1,260	4.2
Coal Mining .. ..	6,310	2.4	61,610	6.1
Wire, etc., Manufacture ..	210	3.8	1,470	7.8
Boot and Shoe Manufacture ..	420	0.4	1,580	5.9
General Engineering, Engineers' Iron and Steel Founding	14,420	5.4	58,770	14.7
Tobacco, etc., Manufacture	240	0.8	1,480	11.8
Marine Engineering ..	60	0.5	8,870	18.1
Saddlery, Harness and other Leather Goods Manufacture	680	3.1	2,050	29.4

The most important relative changes if both the numbers of insured persons concerned and the disparity between the rate of growth or contraction are taken into consideration, are those in stove, grate, pipe, and general iron founding, dressmaking, furniture making, the construction and repair of motor cars, etc., general engineering, and coal mining. In the cases of the iron founding group, furniture making, and the motor car industry the change is mainly due to increases in the south; and in the cases of dressmaking, general engineering, and coal mining the cause lies in decreases in the north.

There are a number of industries in which the rate of expansion has been greater or the rate of decline less in the north than in the south, but, for the most part, this has occurred in industries for which the north affords preponderating natural advantages, as, for example, coke ovens and by-product works, the manufacture of explosives and chemicals, iron and steel and other metal manufacture, the manufacture of certain metal goods, etc.

#### *Geographical distribution of unemployment.*

Another distinction between conditions in the south and the north during the last four years can be observed. The level of unemployment in the southern section has been markedly lower than that prevailing in the northern section. The following table shows the percentage of insured persons unemployed in the various divisions at the end of June and December for each of the five years 1923 to 1927:—

Table showing by divisions the percentage rate of unemployment among insured workpeople in Great Britain and Northern Ireland at the end of the months of June and December in each of the years 1923 to 1926 and of June, 1927.

Divisions.	1923.		1924.		1925.		1926.		1927.	
	June.	December	June.	December.	June.	December	June.	December.	June.	June.
London	9.7	9.0	8.3	8.9	7.2	6.5	7.1	6.5	5.1	5.1
South-Eastern	8.4	9.2	6.2	7.7	4.7	5.8	5.6	5.6	3.7	3.7
South-Western	9.9	10.1	8.0	9.4	7.6	8.4	8.2	8.6	6.0	6.0
Midlands	10.2	9.4	8.3	9.4	10.9	7.7	14.7	9.9	8.3	8.3
North-Eastern	11.4	11.7	9.1	12.2	17.4	14.1	19.9	17.1	12.3	12.3
North-Western	15.1	12.7	12.4	11.1	11.5	10.3	18.2	13.1	9.6	9.6
Scotland	13.8	13.5	11.1	13.6	15.6	15.4	17.5	16.0	9.8	9.8
Wales	5.7	5.6	6.2	14.2	16.5	13.3	21.4	17.6	18.0	18.0
Northern Ireland	16.6	16.3	16.5	17.8	25.4	25.7	25.5	19.9	12.1	12.1
Special Schemes	3.1	3.2	2.2	1.8	1.9	1.9	1.8	1.8	1.3	1.3
Total	..	11.3	10.6	9.3	10.7	11.9	10.4	14.6	11.9	8.8

This table indicates that, with a single exception (that of the Midlands during the coal strike in 1926), the percentage of unemployment in each of the four divisions of the southern section of the country was, at the dates given, always lower than that for the country as a whole. On the other hand, the percentage in each of the northern divisions was always higher than that for the country as a whole, except in regard to Wales at the two dates in 1923 and at June, 1924, the North-eastern Division at June, 1924, and the North-western Division at June and December, 1925.

### Emigration of skilled tradesmen from Great Britain.

This note relates solely to the migration of males (British subjects) over 18 years of age, and among these principally to skilled tradesmen, between the United Kingdom and those parts of the world outside Europe and the Mediterranean basin. Attention is confined to "net" emigration, i.e., the excess of British emigrants over British immigrants. The advantage of taking these figures is that they are a closer indication of the "loss" than are the figures of "gross" emigration, i.e., the actual recorded number of emigrants.

The difference between gross and net emigration is shown by the following figures relating to males over 18 years of age :—

		Average
	1913.	1921-26.
Gross Emigration from British Isles * ..	163,850	76,505
Net Emigration from British Isles ..	123,636	52,607

These figures show that immigration of British subjects was 25 per cent. in 1913 and 31 per cent. in 1921-26 of the gross emigration, but in this connection it must be borne in mind that the emigrants, being upon the whole considerably younger, have longer working lives before them than the immigrants. The point is referred to below.

### Volume of Emigration.

Table 8 (p. 254) shows the volume of net emigration from the British Isles in the pre-war year 1913 and the post-war years 1921-26. [For the last two years, 1925 and 1926, the figures relate only to Great

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\* Great Britain and Northern Ireland only for 1925 and 1926 (see Table 8, p. 254)

Britain and Northern Ireland]. The main feature disclosed by the table is the great reduction in net emigration during the post-war years as compared with 1913.\* The total net emigration in the six years 1921-26 was 315,641, which is not much over two and a half times that of the single year 1913. In the skilled trades, the net emigration during the post-war years was not so far below the level of 1913 as in the case of all occupations, the total for the six post-war years being 114,920, which is over three times the number for the single year 1913. In the period 1921-26, the metal and engineering trades accounted for over two-fifths of the net emigration in the skilled trades as a whole, the aggregate for the six years being 49,282.

The table shows that in 1923 the volume of emigration rose far above the level of any of the other post-war years and came not far short of the figure for 1913. (See, however, the reference below to the influence of the quota system in the U.S.A.) The net increase as compared with 1922 amounted to about 63,000 and was due mainly to the increased emigration of skilled tradesmen (28,000), labourers in skilled trades (12,000) and agricultural workpeople (13,000). In 1924 there was a large decline in these and all other groups shown in the table, except agriculture ; and emigration in 1924, 1925 and 1926 (though showing an increase in the last year) has remained at a low level compared with 1913.

#### *Destination of Emigrants.*

Before the war emigration from this country was mainly to North America. In the period 1909-1913 the outward balance of British passengers between the British Isles and all non-European countries averaged 229,000 annually, while the average was 113,000 to British North America and 56,000 to the U.S.A. The same is true of skilled tradesmen. Of a total net emigration of skilled tradesmen of 35,238 in 1913 from Great Britain, 19,318 was to British North America and 10,347 to the U.S.A. a total of 29,655 to North America, or 84 per cent. of the whole. Since the war both the volume and the direction of emigration have been affected by numerous factors, to two of which reference may here be made.

(a) *The Empire Settlement Act, 1922.*—This Act made provision for financial assistance to suitable persons desirous of emigrating to destinations within the Empire. The Act, of course, was not designed specifically to promote the emigration of skilled tradesmen and, in fact, has been predominantly utilised for persons willing to adopt agriculture as a career. It need not, accordingly, be discussed in detail here, but may merely be noticed as a factor favouring emigration from this country to the Dominions. Particulars of the assisted

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\* The reasons for the post-war reduction in emigration are discussed in the Report of the Overseas Settlement Committee for 1924. (Cmd. 2383).

passages arranged under the Act in the five years 1922-26 are given in Table 9 (p. 255). It will be seen that the number has grown steadily throughout the period, and that those assisted under the Act have formed a steadily increasing percentage of the total number of British subjects migrating from Great Britain to destinations in the Empire.

(b) *Restriction of immigration into the United States.*—Drastic limitations were imposed by the American Immigration Act, 1924, following an earlier Act of 1921. In comparing other post-war years with 1923, it should be noted that the volume of emigration in that year included practically the whole of the quota of British (United Kingdom) immigrants to be admitted to the United States during the fiscal year ending 30th June, 1924; consequently the movement to the United States in 1924 represented in reality only six months emigration. The volume of emigration from this country to the United States, however, remained at a low level in 1925 and 1926. Table 10 (p. 255) shows the net emigration from Great Britain to the United States of (a) all skilled tradesmen and (b) those in the metal and engineering trades in each of the six years 1921-26. The decline in the volume of emigration in 1924 and later years is very marked.

Throughout the whole post-war period 1921-1926 (except in 1923) the emigration of skilled tradesmen to the British Empire has greatly exceeded that to foreign countries. The matter is of interest in connexion with the development of manufacturing industries in the Dominions, and in Table 10 is shown the net emigration from Great Britain of (a) all skilled tradesmen and (b) those in the metal and engineering trades to the principal destinations in the British Empire in each of the six years 1921-26. Out of a total net emigration from Great Britain of skilled tradesmen of 108,622 during the period, 66,422 went to the British Empire, 41,277 to the U.S.A. and only 923 to other foreign countries. During this period the net emigration of skilled tradesmen to British North America and the United States was 68,996 or 64 per cent. of the whole, a marked change from the proportion of 1913.

#### *Country of Origin.*

During the six post-war years considered the emigration of skilled tradesmen from Scotland has been considerably greater in proportion to the total or industrial population of the country than that of England and Wales, the total number from Scotland having been over three-quarters of that from the remainder of Great Britain. In 1923, when emigration as a whole expanded so greatly, emigration from Scotland showed a very large increase, and Scotland's loss of skilled tradesmen considerably exceeded that of England and Wales. Table 11 shows that the increase of net emigration of skilled tradesmen from Scotland in 1923, as compared with 1922, was nearly

18,000, of which nearly 10,000 were due to an increase in the metal and engineering group. These increases in turn corresponded to a considerable extent with increases in the emigration from Scotland to the United States, namely an increase of over 14,000 skilled tradesmen, of which 7,800 was due to an increase in the metal and engineering group. Emigration from Scotland declined sharply in 1924, and has since remained about the levels which prevailed in 1921-22.

#### *Ages of Emigrants.*

The majority of the skilled tradesmen who emigrate are young, i.e., between 18 and 30 years of age. For example, in the metal and engineering group, those between 18 and 30 years were 53 per cent. of all such skilled tradesmen (18 years of age and upwards) in 1921, 58 per cent. in 1922, 62 per cent. in 1923, 58 per cent. in 1924, 59 per cent. in 1925, and 58 per cent. in 1926. Considering the migration of males over 18 as a whole, the average age of the immigrants considerably exceeds that of the emigrants ; thus more than one-half of the male emigrants from the British Isles in 1921-25 of 18 years of age and over were recorded as being not more than 30 years of age, whilst about two-thirds of the total number of male immigrants of 18 years and upwards were over 30 years of age.

#### *Effect on emigration of schemes of social insurance.*

An Interdepartmental Committee was appointed in November 1925, to consider how far the existing provision for old-age pensions and for national health and unemployment insurance tends to discourage migration from this country with a view to settlement in the Empire overseas, and how far any such tendency will be accentuated by the Widows', Orphans' and Old Age Contributory Pensions Act. In their Report (Cmd. 2608) dated February, 1926, the Committee expressed the opinion that the two chief causes tending at that time to discourage migration were :—

- (1) bad trade conditions ; and
- (2) the restrictions which the Dominion Authorities found it necessary to place on the grant of assisted passages.

At the same time they found that the cumulative effect of the various schemes of social insurance was a subsidiary factor tending to discourage migration, both directly as a result of the sense of security induced by the schemes, and indirectly in that they raise the standard of living in this country and so counteract to an appreciable extent the attraction of the life of independence offered in the Dominions. Discussing the various schemes separately, the Committee did not think that national health insurance or old age pensions (either contributory or non-contributory) acted perceptibly

as a check on migration, but they came to the conclusion that the unemployment insurance scheme and the comparatively recent extension of outdoor Poor Law relief to able-bodied persons discouraged migration to an appreciable extent at precisely those ages when, other things being equal, it might be expected that the opportunities of overseas life would prove most attractive. They thought that the Widows' and Orphans' Pensions Scheme would have some influence (not capable of being estimated at that date) on married men.

As to possible methods of counteracting the adverse effect of social insurance on migration, the Committee considered it impracticable to make arrangements to continue the insurance of migrants on their arrival overseas or to grant surrender values to such persons in respect of their past contributions. The Committee, however, made a number of recommendations :—

- (a) That the general question of the standardisation of schemes of social insurance throughout the Empire should be considered by the next Imperial Conference.
- (b) That the attention of Lord Blanesburgh's Committee on the Administration of Unemployment Insurance Acts (which was then sitting) should be drawn to the diminution of interest in migration shown by juveniles approaching the age of 18 and in the years immediately following that age, owing, apparently, to the fact that the adult rate of unemployment benefit became payable at 18.\*
- (c) That persons in receipt of pensions under contributory pension schemes should, on proceeding overseas as migrants, be credited with a year's pension in lieu of the pension which they will surrender on migration.
- (d) That the cost of the Medical examination of persons insured under the National Health Insurance Act who make application for assisted passages should be provided from National Health Insurance funds.
- (e) That publicity should be given to such social insurance schemes as exist in the Dominions and to the facilities provided by the National Health Insurance Act for the transfer of the insurance of migrants.
- (f) That extended facilities should be provided for training juveniles in the elements of rural occupations.

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\* Lord Blanesburgh's Committee in its Report (January, 1927) recommended separate rates of contributions and of benefit for young men and women aged 18 to 21, and in doing so stated that they had taken into account the view of the Committee which considered the effect on migration of schemes of social insurance. The Unemployment Insurance Act, 1927, made provision for separate scales, under which the full adult rates will not, normally, be payable until the age of 21.

## APPENDIX.

TABLE 1.  
*Estimated number of persons insured under the Unemployment Insurance Acts in certain exporting industries  
 at July 1923, 1924, 1925, 1926 and 1927.*

## GREAT BRITAIN.

Industry	July, 1923.	July, 1924	July, 1925.	July, 1926.	July, 1927.
<i>Coal Mining</i>	1,243,450	1,259,200	1,233,000	1,225,220	1,198,800
<i>Iron and Steel Industries</i> —					
Pig Iron Manufacture (Blast Furnaces)	28,890	30,090	25,500	24,300	24,920
Steel Melting and Iron Puddling Furnaces, Iron and Steel Rolling Mills and Forges.	210,690	206,580	198,070	192,220	194,490
Manufacture of Tin Plates	..	..	..	..	..
Iron and Steel Tube Making	..	..	..	..	..
Wire, Wire Netting, Wire Rope Manufacture	..	..	..	..	..
Stove, Grate, Pipe, etc., and General Iron Founding	..	..	..	..	..
Bolts, Nuts, Screws, Rivets, Nails, etc., Manufacture	29,720	29,720	27,590	27,270	25,910
<i>Engineering, Shipbuilding and Electrical Industries</i> —					
General Engineering, Engineers' Iron and Steel Foundry	658,670	620,500	615,800	605,030	593,450
Electrical Engineering	..	..	75,780	76,230	79,050
Marine Engineering, etc.	..	..	60,240	55,550	52,540
Constructional Engineering	..	..	23,970	25,850	27,430
Construction and Repair of Motor Vehicles, Cycles and Aircraft	190,430	190,430	201,960	212,590	221,810
					230,970

Railway Carriage, Wagon and Tramcar Building	..	50,370	52,020	55,270	55,450	55,850
Hand Tool, Cutlery Saw, File Making	..	29,940	31,510	33,720	35,000	35,050
Shipbuilding and Ship Repairing	..	245,530	232,760	221,530	208,510	203,180
Electric Cable, Wire and Electric Lamp Manufacture	..	72,030	74,880	81,390	87,440	84,470
<i>Tertiary Industries</i> :—						
Cotton Industry	..	..	..	..	..	..
Woollen and Worsted Industry	..	268,230	260,480	254,890	252,330	247,970
Silk	..	..	..	..	..	..
Hosiery	..	..	..	..	..	..
Carpet Manufacture	..	..	..	..	..	..
Textile Bleaching, Printing, Dyeing, etc	..	..	..	..	..	..
<i>Clothing Industries</i> :—						
Tailoring (Wholesale and Retail)	..	..	..	..	..	..
Boot, Shoe, etc., Manufacture and Repairing	..	..	..	..	..	..
<i>Chemical Industries</i> :—						
Chemicals Manufacture	..	..	..	..	..	..
Explosives Manufacture	..	..	..	..	..	..
Total in the above Exporting Groups	..	..	..	..	..	..
Total in all other Insured Industries..	..	6,628,120	6,798,270	7,042,560	7,206,650	7,336,520
Total in all Insured Industries	..	11,231,980	11,403,510	11,623,220	11,773,700	11,875,800

TABLE 2.

Numbers unemployed at the end of June and December quarters among insured workpeople in certain exporting industries.  
1923-27.

Industry	GREAT BRITAIN.					December, 1927.
	June, 1923	December, 1923*	June, 1924	December, 1924	June, 1925	
<i>Coal Mining</i>	31,948	30,255	59,728	99,144	314,659	140,397
<i>Bronze and Steel Industries</i> —						126,077
Pig Iron Manufacture	2,784	3,361	3,976	5,443	5,860	5,199
(Blast Furnaces)						18,087
Steel Melting and Iron Pudding Furnaces,	43,986	36,520	39,929	57,119	51,059	48,839
Iron and Steel Rolling Mills and Forges						110,585
Manufacture of Tin Plates	1,124	1,089	797	13,166	5,568	2,996
Iron and Steel Tube Making	3,893	3,757	3,002	5,455	4,959	4,300
Wire, Vine Netting, Wine Rope Manufacture	2,188	2,408	2,550	2,917	3,472	2,918
Stove, Grate, Pipe, etc., and General Iron Founding	14,252	12,555	9,362	9,525	8,533	8,245
Bolts, Nuts, Screws, Rivets, Nails, etc., Manufacture	5,075	4,066	3,438	4,634	3,730	2,816
<i>Engineering, Shipbuilding and Electrical Industries</i> —						8,007
General Engineering, Engineers' Iron and Steel Foundry	138,936	122,051	92,676	84,434	75,289	71,283
Electrical Engineering						112,893
Marine Engineering, etc	14,006	14,212	8,585	3,322	3,580	4,009
Constructional Engineering	2,805	2,808	2,856	2,856	3,297	2,997

Construction and Repair of Motor Vehicles, Cycles and Aircraft, Engineering, etc., <i>contd.</i> —	18,118	19,273	13,470	15,112	11,974	14,506	22,056	18,794	12,638	15,874
Railway Carriage, Wagon and Tram-car Building	2,219	2,636	2,474	4,082	3,478	3,893	9,655	9,523	2,864	3,310
Hand Tool, Cutlery, Saw, File Making	4,849	4,237	4,366	3,806	3,936	4,166	8,397	5,782	5,983	4,065
Shipbuilding and Ship Repairing	112,639	86,735	64,679	73,694	77,005	82,966	88,152	88,408	47,499	42,227
Electrical Cable, Wire and Electric Lamp Manufacturing	7,102	5,608	5,218	4,732	5,777	4,512	6,408	6,254	6,541	3,920
<i>Textile Industries:</i> —										
Cotton Industry	122,186	69,001	87,316	39,364	48,802	38,632	143,991	76,554	40,390	56,992
Woollen and Worsted Industry	18,488	26,982	15,745	23,631	50,959	22,514	63,933	27,891	23,952	17,034
Silk	...	2,412	3,659	1,636	2,987	2,956	5,050	5,565	5,310	3,268
Hosiery	...	6,036	7,585	4,361	8,298	8,457	4,567	14,312	7,836	3,322
Textile Manufacture	...	881	1,021	1,664	1,915	2,842	1,794	5,954	1,865	3,889
Textile Bleaching, Printing, Dyeing, etc.	11,586	13,939	13,971	12,827	12,570	12,021	23,376	19,756	12,598	904
<i>Clothing Industries:</i> —										
Tailoring (wholesale and retail)	10,147	22,226	8,426	22,724	9,749	20,953	12,418	24,826	5,969	17,107
Boot, Shoe, etc., Manufacture and Repairing	12,485	13,861	10,658	16,499	14,110	11,976	19,307	15,011	9,320	9,231
<i>Chemical Industries:</i> —										
Chemicals Manufacture	11,901	10,531	9,217	8,852	8,264	7,974	12,400	8,349	5,888	5,516
Explosives Manufacture	2,476	2,126	1,767	1,663	1,350	1,349	2,993	1,604	1,332	1,024
Total in the above Exporting Groups	608,502	525,979	475,189	539,066	754,096	544,866	†891,927	†673,741	550,018	541,596
Total in all other Insured Industries	647,130	662,214	569,351	677,779	586,983	629,895	791,268	705,280	488,685	623,172
Total in all Insured Industries	1,255,682	1,188,193	1,044,540	1,216,845	1,341,079	1,174,761	†1,683,195	†1,379,021	1,038,703	1,164,768

\* Including a due proportion of systematic short time workers  
 † Excluding persons in the Coal Mining Industry who ceased work on account of dispute which commenced 1st May, 1926.

TABLE 3.  
Percentages unemployed at the end of June and December quarters among insured workpeople in certain exporting industries.  
1923-27.

GREAT BRITAIN.						
Industry	June, 1923.	Decem- ber, 1923.	June, 1924.	Decem- ber, 1924	June, 1925.	Decem- ber, 1925.
<i>Coal Mining</i>	2.6	2.4	4.8	7.9	25.0	11.4
<i>Iron and Steel Industries</i>	9.6	11.6	13.8	18.1	20.4	10.2
Pig Iron Manufacture (Blast Furnaces)	9.6	11.6	13.8	18.1	20.4	10.2
Steel Melting and Iron Puddling Furnaces,	20.9	17.3	19.0	27.6	24.7	12.8
Iron and Steel Rolling Mills and Forges,						17.0
Manufacture of Tin Plates	3.8	3.6	2.7	45.0	10.6	34.8
Iron and Steel Tube Making	15.7	15.1	12.1	20.2	18.3	22.1
Wire, Wire Netting, Wire Rope Manufacture	9.1	10.0	10.6	11.9	14.2	15.6
Stove, Grate, Pipe, etc., and General Iron	17.0	15.0	11.2	11.7	10.5	11.8
Founding						16.8
Bolts, Nuts, Screws, Rivets, Nails, etc.,	17.1	13.7	11.6	16.8	9.8	13.2
Manufacture,						8.8
<i>Engineering, Shipbuilding and Electrical Industries</i>	21.1	18.5	14.1	13.6	12.1	11.6
General Engineering, Engineers' Iron and						18.3
Steel Founding	6.5	5.7	5.5	5.0	5.6	11.4
Electrical Engineering	..	..	..	23.8	14.4	25.3
Marine Engineering, etc.	..	..	..	12.1	12.3	11.8
Constructional Engineering	..	..	..	10.1	7.1	5.9
Construction and Repair of Motor Vehicles,	9.5					6.8
Cycles and Aircraft.						10.4
Railway, Carriage, Wagon and Tramcar	4.4	5.2	4.9	7.8	6.7	7.0
Building.						17.5
						17.2
						5.2
						5.9

Hand Tool, Cutlery, Saw, File Making ..	16.2	14.2	14.6	12.1	12.5	12.4	24.9	16.5	17.1	11.6
Shipbuilding and Ship Repairing ..	45.9	35.3	26.3	31.7	33.1	37.5	39.8	42.4	22.8	20.8
Electrical Cable, Wire and Electrical Lamp Manufacture.	9.9	7.8	7.2	6.3	7.7	5.5	7.9	7.2	7.5	4.6
<i>Textile Industries</i> —										
Cotton Industry ..	..	..	21.5	12.2	15.4	6.9	8.5	6.7	25.1	10.0
Woollen and Worsted Industry ..	..	..	6.9	10.1	5.9	9.1	19.6	8.8	25.1	6.9
Silk ..	..	..	6.5	9.8	4.4	7.2	7.1	10.8	12.0	6.0
Hosiery ..	..	..	6.8	8.5	4.9	8.9	9.1	4.7	14.8	6.4
Carpet Manufacture ..	..	..	3.5	4.0	6.6	7.1	10.5	6.9	22.9	3.9
Textile Bleaching, Printing, Dyeing, etc...	..	..	11.0	13.2	13.2	11.6	11.3	11.1	21.6	11.5
<i>Clothing Industries</i> —										
Tailoring (Wholesale and Retail) ..	..	..	5.6	12.2	4.6	12.2	5.2	10.9	6.5	3.1
Boot, Shoe, etc., Manufacturing and Repairing.	..	..	8.9	9.8	7.6	11.6	9.9	8.4	13.5	6.6
<i>Chemical Industries</i> —										
Chemicals Manufacture ..	..	..	11.5	10.2	8.9	9.1	8.5	13.0	8.9	5.8
Explosives Manufacture ..	..	..	13.2	11.3	9.4	8.7	7.1	7.4	16.3	5.4
Total above Exporting Groups ..	..	..	13.2	11.4	10.3	11.7	16.4	11.9	19.5	11.9
Total all other Insured Industries..	9.8	10.0	8.4	10.0	8.3	8.3	8.9	11.0	9.8	8.5
Total all Insured Industries (including Non-Export Trades)	11.2	10.6	9.3	10.7	11.8	10.1	14.5	11.7	8.8	9.8

TABLE 4.  
*Estimated number of persons insured under the Unemployment Insurance Acts in certain non-exporting industries at July 1923, 1924, 1925, 1926, and 1927.*  
 GREAT BRITAIN.

Industry.	July, 1923.	July, 1924.	July, 1925.	July, 1926.	July, 1927.
Building	703,250	713,530	745,450	789,560	833,940
Furniture-making, Upholstering, etc.	93,030	96,350	100,810	106,750	113,190
Gas, Water and Electricity Supply Services	169,480	167,380	174,000	180,800	168,530
Transport and Communication —					
Railway Service	188,170	170,430	166,000	158,340	147,710
Tramway and Omnibus Service	106,810	116,980	118,400	126,910	132,940
Other Road Transport	145,340	147,580	155,230	159,270	168,670
Shipping Service	124,000	123,250	134,820	137,570	138,870
Distributive Trades	1,234,750	1,332,180	1,440,300	1,485,150	1,549,780
Commerce, Banking, Insurance and Finance	223,980	221,680	216,110	217,160	219,620
Total	2,988,810	3,089,360	3,251,120	3,361,510	3,473,250
All Insured Industries (including exporting trades)	11,231,980	11,403,510	11,623,220	11,773,700	11,875,800

TABLE 5.  
*Numbers unemployed at the end of June and December quarters among insured workpeople in certain non-exporting industries.*  
1923-27.

GREAT BRITAIN.

Industry.	June, 1923.*	Decem- ber, 1923.*	June, 1924.	Decem- ber, 1924.	June, 1925.	Decem- ber, 1925.	June, 1926.	Decem- ber, 1926.	June, 1927.	Decem- ber, 1927.
Building Furniture Making, Upholstering, etc.	87,126 6,606	94,768 6,784	56,239 5,783	82,574 5,709	50,910 5,283	96,947 4,896	68,191 8,553	103,717 6,935	52,112 4,932	132,818 4,380
Gas, Water and Electricity Supply Services.	12,609	10,666	9,503	10,576	9,542	9,609	10,390	10,334	7,916	8,917
Transport and Communication:—										
Railway Service	11,166	11,080	9,436	11,411	9,214	10,413	31,658	13,874	6,497	7,711
Tramway and Omnibus Service	3,052	3,798	3,175	4,070	4,024	4,537	6,113	6,035	3,604	4,301
Other Road Transport	25,225	23,138	20,620	21,835	18,862	18,887	21,883	20,763	16,295	18,747
Shipping Service	20,104	24,308	18,593	26,838	23,056	25,677	28,384	27,103	18,746	24,155
Distributive Trades	70,947	72,542	75,039	84,611	81,704	77,164	94,701	87,582	68,718	72,535
Commerce, Banking, Insurance and Finance.	9,682	9,543	8,760	7,905	7,103	6,653	6,490	6,060	4,755	4,921
Total	246,517	256,627	207,148	255,529	209,698	254,783	276,363	282,403	183,575	278,455
All Insured Industries (including Exporting Trades).	1,255,682	1,188,193	1,044,540	1,216,845	1,341,079	1,174,761	1,633,195	1,379,021†	1,038,703	1,164,768

\* Including a due proportion of systematic short time workers.

† Excluding persons in the Coal Mining Industry who ceased work on account of the dispute which commenced 1st May, 1926.

TABLE 6.  
*Percentages unemployed at the end of June and December quarter among insured workpeople in certain non-exporting industries.*  
1923-27.

Industry.	GREAT BRITAIN.					
	June, 1923.	Decem- ber, 1923.	June, 1924.	Decem- ber, 1924.	June, 1925.	Decem- ber, 1925.
Building ..	12.4	13.5	8.0	11.6	7.1	13.0
Furniture Making, Uphoistering etc.	7.1	7.3	6.2	5.9	5.5	4.9
Gas, Water and Electricity Supply Service	7.4	6.3	5.6	6.3	5.7	5.5
Transport and Communica- tion.—						
Railway Service ..	5.9	5.0	6.7	5.4	6.3	19.1
Tramway and Omnibus Service	2.9	3.6	3.0	3.5	3.4	5.2
Other Road Transport ..	17.4	15.9	14.2	12.8	12.2	14.1
Shipping Service ..	16.2	19.6	15.0	21.8	18.7	19.0
Distributive Trades Commerce, Banking, Insurance and Finance	5.7	5.9	6.1	6.4	5.4	6.6
	4.3	4.3	3.9	3.6	3.2	3.1
Total .. ..	8.2	8.6	6.9	8.3	6.8	7.8
All Insured Industries (including Exporting Trades).	11.2	10.6	9.3	10.7	11.8	10.1
						14.5
						11.7
						8.4
						8.5
						5.5
						8.0
						8.8
						9.8

TABLE 7.  
*Numbers aged 10 years and over engaged in certain groups of exporting industries, as shown by the Census of Population, 1901-11-21.*

		1901.		1911.		Percentage Increase, 1901-11.		1921.		Percentage Increase, 1911-21.	
		(1)		(2)		(3)		(4)		(5)	
		752,000		1,021,000		1,128,000		1,305,000		1,361,000	
<i>Coal (and Shale) Mining</i>	..										
<i>Iron and Steel, Engineering</i>	..										
<i>Electrical Industries</i>	..										
Manufacture of Metals, Machines, Implements and Conveyances	1,447,000		1,765,000		22		1,779,000		2,491,000		40
<i>Textile Industries</i> :—											
Cotton	..	..	..	..	..	544,000	620,000	14	646,000	621,000	4
Wool and Worsted	..	..	..	..	..	235,000	248,000	6	261,000	260,000	(Decrease) 0
Silk	..	..	..	..	..	37,000	31,000	32	33,000	34,000	(Decrease) 3
Bleaching, Printing, Dyeing and Finishing	..	..	..	..	..	79,000	105,000	17	111,000	117,000	6
<i>Clothing Industries</i> :—											
Tailoring	..	..	..	..	..	268,000	280,000	4	294,000*	317,000	8
Boots and Shoes and Clogs	..	..	..	..	..	249,000	230,000	(Decrease) 8	234,000*	212,000	(Decrease) 9
<i>Chemical Industries</i> :—											
Manufacture of Chemicals, Explosives, Paints, Oils, Rubber, etc.	101,000		149,000		47		183,000		269,000		47
Total of above Exporting Groups	..	3,712,000	4,449,000		19.9		4,669,000		5,626,000		20.5
Total Occupied	..	16,312,000	18,354,000		12.5		18,354,000		19,357,000		6.5

*Note*—It will be observed that the figures given in column (2) for the year 1911 for the various groups are different from those given in column (4) for the same year. The reason lies in the change of classification made in 1921. The figures for 1901 in column (1) must be compared with those for 1911 in column (2) and those for 1911 in column (4) must be used for comparison with those for 1921 in column (5). The figures for 1901 and for 1911 in column (2) exclude maintenance staff, clerks, carriers and certain other occupations common to all industries. The figures for 1911 in column (4) and those for 1921 include all persons engaged in the industry. For further details, see "Survey of Industrial Relations," Chapter VI, Table 5, pp. 416-7.

\* These two figures are partly estimated, having been arrived at by adding to those for England and Wales (given on p. 420 "Survey of Industrial Relations") an estimate in respect of Scotland. To this extent, consequently, the total in column (4) for the exporting groups is an estimate.

TABLE 8.

*Net emigration classified by occupations.*

Net number of Male Emigrants of British Nationality of 18 years of age and upwards to and from Non-European Countries following the undermentioned occupations, 1913 and 1921-1926.

Occupations of Emigrants.*	From British Isles					From Gt. Britain and N. Ireland.	
	1913.	1921.	1922.	1923.	1924	1925.	1926.
Agricultural ..	30,070	10,570	10,564	23,980	16,335	7,509	12,036
Commercial, Finance and Insurance ..	0,956	6,594	4,555	8,612	4,745	4,357	6,060
Professional ..		2,116	782	1,580	947	975	1,146
Skilled Trades :—							
Mining and Quarrying ..	2,328	4,099	6,521	1,419	2,756	4,996	
Metal and Engineering ..	Not avail- able	5,135	7,979	21,831	3,624	4,496	6,217
Building ..	731	1,117	3,160	820	621	867	
Other .. ..	4,656	5,289	14,737	3,589	3,075	4,857	
Total Skilled	36,465	12,850	18,484	46,249	9,452	10,948	16,937
Transport and Communications	Not avail- able.	1,839	1,819	3,547	1,598	1,368	1,804
Labourers not in Agriculture or Transport	23,589	7,374	5,477	17,755	4,889	2,823	3,895
Other and Ill-defined Occupations	12,556	3,070	3,849	6,339	3,543	2,521	3,748
* Grand Total 18 years and over	123,636	44,413	45,530	108,062	41,509	30,501	45,626

\* Inclusive of a very small number of migrants of 12 years of age and over, whose ages were not specified.

*Note.*—The exclusion of the Irish Free State (1925 and 1926) affects mainly the figures relating to agricultural workmen. For 1924, the net emigration of males from Great Britain and Northern Ireland was 32,561, i.e. 8,948 less than the net emigration of males from the British Isles shown in the table. Of this difference, 6,623 were agricultural workmen, and only 510 were skilled tradesmen.

TABLE 9.

*Empire Settlement Act, 1922.*

Departures in 1922-26 of applicants and dependants of applicants to whom assisted passages have been granted.

	1922.	1923.	1924.	1925.	1926.	Total 1922-26.
To Australia .. ..	5,611	24,221	23,645	22,527	32,732	108,736
,, New Zealand .. ..	688	6,086	7,750	8,097	11,795	34,416
,, Canada .. ..	180	5,845	9,323	8,809	21,344	45,501
,, South Africa .. ..	—	41	39	126	232	438
,, India .. ..	—	2	1	—	—	3
Total .. ..	6,479	36,195	40,758	39,559	66,103	189,094
Percentage of departures under Empire Settlement Act to total emigration of British subjects from Great Britain to destinations in the Empire .. ..	5%	23%	31%	38%	50%	29%

TABLE 10.

*Net emigration of skilled tradesmen from Great Britain*

(a) All skilled tradesmen.

Year.	To British North America.	To Australia.	To New Zealand.	To British Empire.	To U.S.A.
1913 .. ..	19,318	3,972	1,166	24,480	10,347
1921 .. ..	2,603	2,305	1,389	8,075	3,850
1922 .. ..	3,385	4,983	1,667	10,425	6,993
1923 .. ..	11,671	4,725	1,098	17,723	26,178
1924 .. ..	4,059	4,154	1,173	9,774	1,533*
1925 .. ..	1,806	4,383	1,190	7,803	2,456
1926 .. ..	4,195	5,653	1,945	12,622	3,333
Total 1921-26	27,719	26,203	8,462	66,422	41,277

\* Excess of immigrants over emigrants.

TABLE 10—*continued.*

(b) Skilled tradesmen in the metal and engineering trades.

Year	To British North America.	To Australia.	To New Zealand.	To British Empire.	To U.S.A.
1913 .. {	Not available.	Not available.	Not available.	Not available.	Not available.
1921 .. ..	1,034	987	532	3,532	1,272
1922 .. ..	1,481	1,932	548	4,187	3,327
1923 .. ..	5,198	1,920	299	7,521	13,290
1924 .. ..	1,621	1,377	334	3,588	535*
1925 .. ..	852	1,422	391	2,974	1,109
1926 .. ..	1,485	1,832	569	4,395	1,368
Total 1921-26	11,671	9,470	2,673	26,197	19,831

\* Excess of immigrants over emigrants.

TABLE 11.

Net emigration of skilled tradesmen from (a) England and Wales and (b) Scotland.

	All skilled trades.		Metal and Engineering.	
	From England and Wales.	From Scotland	From England and Wales.	From Scotland.
1913 .. ..	27,050	8,188	Not available.	
1921 .. ..	7,619	4,474	3,254	1,641
1922 .. ..	9,915	7,662	3,888	3,727
1923 .. ..	18,616	25,417	7,415	13,482
1924 .. ..	6,773	1,672	2,717	462
1925 .. ..	6,653	3,735	2,693	1,532
1926 .. ..	9,194	6,892	3,512	2,349
Total 1921-26 ..	58,770	49,852	23,479	23,193

## CHAPTER VI.

## INDUSTRIAL FLUCTUATIONS.

No analysis of the present position of British Industry and Trade would be complete without reference to the periodic wave movements or "cycles" of productive activity which have been so marked a feature of the industrial, commercial and financial history of this country, in common with all the principal commercial countries of the world during the past century. In the study of this difficult matter the Committee have taken into account not only the evidence given before them, but also the principal results of recent scientific research on the subject in this country and abroad. They have also received valuable assistance from economists, statisticians and banking authorities who have given special study to the various aspects of the trade cycle.

A general recognition of the existence and importance of trade cycles underlay much of the evidence which was put before the Committee by the representatives of trade and industry, and though naturally this evidence was primarily directed to the factors influencing particular groups of trades, it was realised by the trade witnesses that, apart from special and local circumstances, trade and industry as a whole has in the past been affected to a greater or less extent by periodic fluctuations in productive activity. Periods of good trade and full employment, usually accompanied by rising prices, have been regularly followed by periods of depression, falling prices and unemployment which in turn have been followed by a renewed upward movement. The critical point at which the upward movement has given place to a decline has sometimes, though not invariably, been marked by a financial crisis.

The wave movement though quite definite and continuous has not been uniform either in period (i.e. the length of time between successive "crests" of the wave) or in amplitude (i.e. the height of the crest above the trough). On the whole the evidence seems to point to a gradual shortening of the period, which in the case of the waves immediately preceding the war was approximately seven years as compared with ten or eleven years in the first half of the nineteenth century. But in this respect the experience of different countries has not been quite identical, and it would seem probable that though the predominant cause of trade cycles may well be international, the form and duration of the wave movements may have been modified in each country by economic perturbations due to causes peculiar to that country. Our attention has been called to the striking similarity between the form of the cyclical curve of trade and that of the curve representing the movement of a

pendulum which was originally set in motion by some force which would cause it to swing uniformly in a fixed period, but which is perturbed by a continual but irregular bombardment by small missiles. The missiles represent the accidental disturbing causes, e.g. failure of crops, earthquakes or other local causes by which the uniform swing of the trade cycle is modified.

The existence of the trade cycle was recognised by traders long before economists endeavoured to find a scientific explanation of it. How far back the definite wave movement goes it is difficult to say, in the absence of any adequate statistics of industry before the nineteenth century, but it is sufficient for our purpose to know that the phenomenon has been a conspicuous feature of industry at all events from the period immediately following the Napoleonic Wars.

Whatever be the explanation of the cyclical movement there is unanimity among all observers that its social and economic effects have been extremely injurious. There may be room for difference of opinion as to the advantages of absolute stability as compared with alternations of slight upward and downward movements of trade and prices. But there can be no difference of opinion as to the disastrous results of such violent fluctuations as have characterised the last hundred years. Even if we set aside as abnormal and unrepresentative the deep and prolonged European depression which has occupied the greater part of the post-war period, and which is not yet at an end, the unemployment resulting from the recurring series of depressions which appeared to be a normal incident of pre-war industry was sufficiently acute and prolonged to cause deep distress. And these grave consequences were incompletely offset by the intervening periods of active production. There is no need to enter in detail into the well-known evils, financial, commercial, social and industrial, which are the inevitable concomitants of violent fluctuations of productive energy. The question with which the Committee is mainly concerned is how far any of these evils are remediable. Remedial action may aim either at mitigating the effects of trade cycles or at removing their causes. Under the former head come all measures for alleviating the suffering caused by cyclical unemployment, e.g. by unemployment insurance, or by other forms of relief, including schemes of relief employment or the acceleration or retardation of programmes of public works.

We are, however, here more particularly concerned with the question raised by the second heading, viz. how far it is possible by measures which can be recommended as practicable and expedient to bring under control the cyclical movements of trade with a view to diminishing either the length of the period or the amplitude of the fluctuation.

It is obvious that no answer to this question can be successfully attempted without at least some rudimentary knowledge of the main

causes underlying trade fluctuations, and here we enter a region of acute and unsettled controversy among theoretic economists. A very great amount of scientific work of varying degrees of value has been done on this subject in recent years in this country, in America, and elsewhere. Broadly speaking, the aim has been twofold—(a) to study by statistical methods the forms and characteristics of actual cyclical movements as affecting different classes of economic phenomena, (b) to investigate by means of theoretic economic analysis the causation of cyclical movements and to assign to each group of causes its proper weight.

The objective study of trade cycles has been largely carried on in America by the Harvard Committee on Economic Research and in Great Britain by the Cambridge and London Economic Service, which works in co-operation with Harvard. Internationally, a good deal of study has been devoted to this subject by the League of Nations and the International Labour Office, acting through the Joint Committee on Economic Crises. Movements of employment, prices, production, Stock Exchange securities, Bank deposits, etc., have been carefully reviewed with the object both of ascertaining the most trustworthy and sensitive indices of changes in productive energy in special fields or generally, and of creating a composite index or "economic barometer" which should furnish a still more accurate measure of such changes in the aggregate. This object has been combined, especially in America, with the further aim of "business forecasting," i.e. the establishment of criteria which would enable sound inferences to be drawn by business men as to the trend of business activity in the immediate future, either in trade generally or in particular industries. The evidence before us, however, suggests that whatever success may be achieved in the future in the way of forecasting the future trend of industry by statistical observation of past changes, the successful prediction of the course of particular industries is not yet established as a practical business proposition. For the present purpose, therefore, we may consider the question of "economic barometers" purely from the point of view of the improvement and enlargement of the available data which commercial, industrial and financial experts have at their disposal when taking their decisions as to future policy.

The results of recent economic analysis as to the causation of trade cycles agree in classifying their causes under three main heads, (a) physical, (b) psychological, (c) monetary, though different economists attach different degrees of importance to the three headings. Under (a) fall such causes as variations in the yield of crops, earthquakes, floods, and other catastrophic phenomena. Whether or not, as some have believed, cosmical forces, e.g. variations in solar energy, play any appreciable part in causing variations in harvest yield, and hence in productive activity, it is obvious that we must regard this class of causes as outside the scope of human control and,

therefore, of remedial action, except the kind of action which is concerned with mitigating effects, rather than with removing causes. The other main factors, psychological and monetary, are *prima facie* capable of being affected by human action—the psychological factor by every kind of measure which enables men to form more accurate and consistent judgments as to the economic situation or induces them to act systematically on these judgments; the monetary factor by measures destined to control or affect the expansion and contraction of credit and the fluctuations in the commodity price of gold.

Before entering on the further question of practicability of remedial action it is of interest to note the rough estimate made by Professor Pigou, in his recent valuable treatise on Industrial Fluctuations, of the relative importance of the three factors enumerated above. His method is to inquire what effect on the intensity of the fluctuations might be expected from the removal of each of the factors separately while leaving the others in full operation. The result (for which the author expressly disclaims any authority beyond a guess) is that the stabilising of harvests might perhaps reduce the amplitude of the trade cycle by one-quarter, while the separate elimination of the psychological and the monetary factors might be expected in each case to reduce it by one-half. It is not, of course, admissible to add these fractions together to arrive at the joint effect to be expected from the simultaneous removal of all three factors. But without laying undue stress on the actual figures, and while allowing a very wide margin of error in a matter on which exact data are necessarily unobtainable, we may reasonably infer that the two predominant elements in trade cycles are the psychological and monetary factors.

Even this guarded conclusion is subject to an important qualification, viz. that the psychological and monetary factors are not entirely independent, being to some extent different facets of the same underlying cause. For on the one hand aberrations of judgment through undue pessimism or optimism can only produce their full economic effect through the mechanism of credit, while on the other hand the vital decisions which influence credit movements (e.g. as to the bank rate and the conditions of bank loans) are taken by individuals who are liable like other men of business to psychological influences and aberrations of judgment. Nevertheless, it is most convenient for purposes of analysis to consider these two factors separately.

The practical importance of the psychological element in trade fluctuations (i.e. the part played by those aberrations of human desire and belief which are fundamentally irrational) lies in the fact that under modern industrial and commercial conditions the interval between the initiation of production and final consumption is often so great that entrepreneurs are compelled to found their programme

of production not on existing market conditions, but on guesses as to the conditions which will prevail at the time when the goods will be ready for delivery. The uncertainty thus caused is enhanced, and its period lengthened, as soon as the point is reached at which the plant available is insufficient to enable demand to be met, for new plant takes much longer to produce than consumable goods, and the chance of miscalculation becomes progressively greater as existing skilled labour becomes more fully absorbed, and makers of plant become congested with orders. The phenomenon of plant ordered during the upward movement of the wave but only delivered after that period has given place to a decline is a familiar feature of the trade cycle, and tends to accentuate the gravity of the succeeding depression. When we add the well-known fact that confidence and mistrust are contagious, it is easy to see that an initial movement of over-confidence or irrational mistrust tends to become magnified from a mere ripple to a powerful wave movement. The violence of the upward movement may be greatly accentuated by the operations of merchants and stockholders anxious to increase their stocks in anticipation of a rise in prices and an expansion of consumers' demand. That the upward movement thus generated is a recurrent wave rather than a continuous movement in the same direction arises from the fact that after a certain point the costs of production tend to outrun the prices at which the products can find a market. Many causes conduce to this result, including the absorption into business of the less efficient employers, workpeople and plant, and the diminished return which results when a business attempts to extend its production beyond the point of its maximum efficiency. Moreover, the point at which excessive costs put a definite check on expansion will vary with different classes of business, and the difficult situation of those which first experience the set-back generates distrust even in branches of production which have not yet reached this stage. This distrust once started becomes cumulative until a period of over-confidence is succeeded by one of equally irrational and excessive depression.

The only real remedy for the irrational aberrations of judgment which are the root of the "psychological" factor in trade cycles is the provision of more complete and accurate information and the cultivation by the business community of the habit of systematic use of such data in arriving at practical decisions. The importance of the psychological factor in affecting industrial stability adds additional weight to the arguments which have been used in another section of this Memorandum in favour of more extended compilation and publication of the fundamental statistical data necessary for a right understanding of the trend of productive activity. But the operation of such remedies as these is necessarily a slow process. The data required are not only national but international, and inadequate as is the present equipment of this country in these

respects, that of other countries except the United States is probably still more defective. Still more gradual will be the process of creating a new habit of mind in the business community, of leading them to take broader and longer views of their interests and to base their action less on irrational and erratic impulse and more on the solid ground of reason and experience. In the meantime we can only look for practical results to better and more intelligent leadership on the part of the relatively small number of leading financial, commercial and industrial concerns which command exceptional means of ascertaining the trend of the economic situation, and are accustomed to use to intelligent purpose the data at their command.

An analysis of the monetary factor in trade cycles has been presented to us at our request by one of the leading exponents of this aspect of the theory of fluctuations. At first sight the class of considerations dealt with in such an analysis seem so remote from those which we have just been examining as to give colour to the prevalent idea that the "psychological" and "monetary" explanations of industrial fluctuations are antagonistic and mutually exclusive. We shall, however, see reason to believe that on the contrary the two factors are mutually dependent and complementary, though for reasons of convenience they are best examined separately, and though individual exponents may often differ profoundly in the nature of the remedies on which they base their hopes.

The "monetary" explanation of industrial fluctuations as presented to us may be stated very briefly as follows. Upward and downward movements of productive activity are always accompanied by upward and downward movements of prices. Simultaneously the total demand for products, *expressed in money*, being dependent jointly on the volume of goods and the price-level fluctuates more sharply than either of these two elements considered separately. If, looking at the problem from the angle of demand, we enquire by what mechanism increases and decreases of demand can be brought about, the reply given is that in practice the predominant influence is the increase or decrease of lending by the banks to traders. In other words it is argued that an upward movement of productive activity is accompanied, conditioned and limited by the increase of bank credit, i.e. the amount of capital placed by banks at the disposal of traders. As the upward movement continues, and the whole of the available plant and labour supply become fully employed, there are more and more insistent demands for bank credit to meet the increasing expenses incurred in production, which cannot be offset by increased rapidity of turnover. Therefore, the extent to which and the conditions under which that demand is met by the banks is an important factor in the form, duration and amplitude of the wave movement. Within certain limits the action of the banks and other financial institutions in regard to the curtail-

ment or extension of credit may have an effect in checking the rise and possibly also the fall of productive activity.

A point, however, on which great stress is laid, is that a given action by the banks will produce quite different effects if applied at the earlier stage of the upward movement, or postponed until a later and more critical stage.

Improved employment and higher prices necessarily lead to an increased demand for cash for purposes of circulation, and hence to a drain on the bank reserves. A familiar feature of trade fluctuations is therefore a fall in bank reserves during the later stages of the upward movement—a decline which sooner or later compels the banks to restrict lending in order to protect their reserves. But the danger signal afforded by an actual fall in the banks' reserves comes so late that much of the mischief is already done, and severe measures of credit contraction may be necessary, which could have been mitigated if earlier action had been taken. These stringent measures of control necessarily emphasise and intensify the depression which is already imminent, and thus augment the evil of fluctuation.

For the above reasons exponents of the "monetary" aspect of trade cycles consider it to be of crucial importance that a control over trade credit should be exercised by the banks at an earlier stage of the upward movement than has been usual up to the present. They believe that comparatively slight measures of control would then be sufficient to stabilise the situation and that the present alternations of violent inflation and violent contraction could be avoided.

But at what point is it economically desirable for the banks to intervene? By what criteria can they determine this point, and the character and stringency of the control which is appropriate and sufficient? And how are privately managed banking undertakings, competing among themselves, to be induced or compelled to take action which, though desirable from the public point of view, may conflict with their individual interest, besides being extremely unpopular with their trading clients? We are here at the point of contact between the "monetary" and "psychological" factors, and we have to recognise that both the power and the will of a banker to restrain the expansion of credit are subject to the same kind of psychological and economic conditions and limitations as the power and will of an individual trader to control the expansion of production by restricting his individual commitments. No doubt the head of one of the great banks is likely to command means of access to the relevant data, and to the training and experience necessary for their interpretation, which are greatly superior to those enjoyed by most industrial undertakings. But it is doubtful if under present conditions of competition any great change of practice could reasonably be expected from the joint stock banks except such as is forced upon them by the action of the Central Bank of issue,

e.g. by the credit policy of the Bank of England, whether operating through changes in the Bank Rate of Discount or through other methods such as the purchase or sale of securities. Some go so far as to deny that the joint stock banks have any effective power of initiative in this matter. We believe that this is an exaggerated view, but there is no doubt that the main power of initiative lies with the Central Bank of issue.

The main if not the sole criterion by which the Bank of England determined its discount policy before the war was the condition of its gold reserve, and in any country whose currency is based on gold, the protection of the reserve must always be a governing consideration in fixing the Bank rate. But other factors, e.g. trade stability, may also properly be taken into account so far as they are not incompatible with the main object. It is also clear that the Bank of England will be in a better position to give full weight to these factors if it maintains close contact with the Central Banks of Issue of the other principal countries than if each Central Bank pursues its own separate policy in isolation. While it is difficult without entering on delicate topics to give concrete illustrations of this proposition, the Committee are satisfied that from the point of view of diminishing industrial instability there are important advantages which might be reaped from concerted action among the Central Banks of Issue and which would be unattainable by the unaided action of any single country.

It is certain that in the last few years the Directors of the Bank of England have been more disposed than before the war to give weight in their discount policy to considerations of trade reconstruction and stability, not only within this country but also in the world generally; and it is matter of common knowledge that the Governor of the Bank has been and is in almost continuous personal contact with his colleagues who control the Central Banks in some of the other principal commercial countries, and that the heads of these Banks are also to an increasing extent in touch with one another. The fostering and strengthening of these personal and informal relations is certainly one of the most hopeful developments of the immediate future, capable, if wisely and cautiously guided, of yielding great economic advantages.

Co-operation of this kind, however, is a very delicate plant, and its healthy growth depends in the first instance almost entirely on personal relationships, leading gradually to the building up of a stable tradition of international helpfulness. In the present circumstances of the world, with Russia practically outside the comity of nations, with the currencies of at least two of the principal European countries still unstabilised, and with unsolved problems of international indebtedness still hanging over the world, it is obvious that no firm basis exists for any general international agreements on the subject of gold reserves or other matters of monetary policy.

In 1922, the Genoa Conference recommended that the Bank of England should convene a Conference of Central Banks "with a view to preventing undue fluctuations in the purchasing power of gold." The wording of the resolutions has been widely interpreted as pointing to something in the nature of a formal and public Conference and undoubtedly there has been an expectation that sooner or later such a Conference would be convened. Even, however, if the essential pre-requisite of general stabilisation of currencies were fulfilled (which is by no means yet the case) it seems doubtful if a formal Conference of delegates acting on instructions would be likely to produce such fruitful results as the kind of informal and personal contact which is now being patiently and cautiously developed, while the failure of such a Conference might easily prove a serious set-back to progress along more hopeful lines. What really matters is not the adoption of binding international rules or pledges but the growth of a new habit of mind, and the building up of a tradition of co-operation on the part of those who control monetary policy in different countries.

While for these reasons it is not possible at the present stage to look to any formal international Conference or agreement, so also it is a delusion to imagine that any fresh discovery in the way of index numbers of prosperity or "Economic Barometers" can possibly furnish an automatic means of determining the precise point at which the interests of trade stability demand the tightening or relaxation of the conditions of credit. The perfection of such indices is a matter of great interest and importance, but at best they only furnish material to be taken into account, together with other considerations, in arriving at the critical decision. Thus from whatever angle we approach the question of the trade cycle we always return ultimately to the psychological factor.

In all that has preceded we have assumed that, as laid down in the Genoa resolutions, a general return to a gold standard (including under this term a "gold exchange standard") is an essential pre-requisite of any measures towards stabilisation, thus ruling out various alternative suggestions which have from time to time been proposed (e.g. the substitution of a composite index number for gold as the standard of value), since, whatever theoretic arguments may be adduced in support of such proposals, they are fraught with such grave dangers to business confidence that none of them has any prospect of commanding itself to practical statesmen or to the commercial community.

The following is a summary of the conclusions to be drawn from the above analysis so far as concerns the means of decreasing the violence of trade fluctuations, as distinct from mitigating the evils to which these fluctuations lead.

The first place must be given to the improvement of the fundamental data on which any intelligent appreciation of the economic

## OFFICIAL INFORMATION AND STATISTICS ON INDUSTRIAL AND COMMERCIAL SUBJECTS.

Statistics on matters of direct interest to the industrial and commercial community are published by numerous Departments of the Government. As the space that can be devoted to the subject in this volume is limited, this memorandum is confined to the statistics issued by the Board of Trade (including the Mines Department), the Ministry of Labour, the Ministry of Transport, the General Register Offices in London and Edinburgh, and to the commercial intelligence work of the Department of Overseas Trade, but it should not be overlooked that important statistics are issued by other Departments, e.g. by the Treasury regarding the national finances, the Inland Revenue Department regarding taxation, the Board of Customs and Excise regarding dutiable articles, the Home Office regarding factories, workmen's compensation, etc., the Ministry of Health (or the various Departments under the Scottish Office where the functions of the Ministry of Health are confined to England and Wales) on such matters as public health, health insurance, poor relief, local rates; the Ministry of Agriculture and Fisheries on subjects coming under those headings; and the Board of Education and the Scottish Education Department regarding general, technical, and commercial education. The Committee have made inquiry of the Departments considered in this memorandum, which has been compiled from their replies. The Committee have also consulted with the Treasury on certain aspects of this subject; with the Stationery Office, who are concerned as the Department responsible for the publication of official documents; and with the Permanent Consultative Committee of Statistical Officers, a body set up in 1921 for the purpose of securing more effective co-operation and co-ordination between the different Departments in their statistical work

### GENERAL DESCRIPTION OF THE STATISTICS DEALING WITH AND COMPARISON WITH POSITION IN THE YEARS JUST PRECEDING THE WAR.

The first matter to which attention has been directed is the question whether the statistics and information published by the selected Departments mentioned above are more or less comprehensive and adequate than those issued in the years preceding the war, i.e. whether on the one hand they include new items, or old items in an improved or enlarged form, or are published more frequently, or whether on the other hand items have been curtailed or omitted either permanently on the ground that the information is unnecessary or temporarily on grounds of economy. For a full understanding of this matter it seems necessary to give at the same

time some general description of the scope of the statistics issued by the Departments. The situation is complicated by the fact that since 1913 new Government Departments have been set up and have taken over work in connexion with statistics from the older Departments, particularly from the Board of Trade.

The information given by the Departments on the subject of this section of the memorandum is as follows:—

#### Board of Trade.

During and since the war the functions of the Board of Trade have been limited by the transfer of certain duties to newly created Ministries (Labour and Transport) and to more or less autonomous Departments which have become responsible for the collection and publication of the relevant statistics. On the other hand, since April, 1918, the statistical work of the Board (which previously was not unified) has been brought together in a separate Statistical Department controlled by an Assistant Secretary, with the result that it is now possible to attack the problem of the presentation of data in a more comprehensive manner than before the war, and to make the best use of the available resources and facilities.

The principal statistics with which the Board are directly concerned relate to:—

- (a) External trade of the United Kingdom.
- (b) Industrial production.
- (c) Navigation and shipping.
- (d) Passenger movement and migration.
- (e) Miscellaneous commercial and economic subjects (including wholesale prices),

and the Board are also responsible for the issue of certain

- (f) Statistical abstracts.\*

Since 1913 some of the publications embodying the data referred to above have been amplified, others have been limited in scope; and certain pre-war publications have been suppressed. On the other hand, a greater use is made of the weekly Board of Trade Journal than before the war for the publication of statistics, so that certain statistics are now presented at more frequent intervals; this medium is used also for the interpretation of statistics to a greater extent than before the war.

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\* Besides the statistical publications referred to in the text, there are various other publications of the Board of Trade which are of interest to those engaged in industry and commerce. These include the Assurance Companies' (Annual) Returns, General Annual Reports of the Companies and Bankruptcy Departments, and reports relative to patents, designs and trade marks. A number of special publications on various commercial and industrial subjects are also issued every year. A full list of the principal publications of the Board is given from time to time in the "Board of Trade Journal."

Each of the classes of statistics mentioned above requires separate treatment.

(a) *Statistics of External Trade.*—These statistics include summary figures published monthly and detailed figures published annually.

The "Accounts relating to Trade and Navigation of the United Kingdom," published monthly, contain summary figures of the trade of the United Kingdom in the principal kinds of merchandise, distinguishing for the more important kinds of goods the trade with the principal countries concerned. The accounts also show the imports and exports of bullion and specie, and the tonnage of vessels with cargoes entering at and clearing from United Kingdom ports. All these figures are given both for the latest month and for the unexpired period of the year. In the April, July, etc., issues, quarterly tables are included showing the value of the total trade of the United Kingdom with each country, the quantities of the various articles charged with excise, the value of goods liable to Key Industry Duty entered for home consumption, etc.

The "Annual Statement of the Trade of the United Kingdom" is published in four volumes, which make their appearance towards the end of the year following that to which the figures relate. Volume I consists of summary information. It includes (a) tables showing the total imports, the re-exports, the net imports, and the British exports of each item of the statistical nomenclature and (b) tables showing the imports (gross and net) from and exports and re-exports to each country of each of the three main classes of goods in which the individual items are grouped, i.e. (1) food, drink, and tobacco; (2) raw materials and articles mainly unmanufactured; and (3) articles wholly or mainly manufactured. Volume II contains detailed tables of the imports and re-exports of each item from and to each of the principal countries concerned; where the trade in any individual item is so small that separate particulars for individual countries would not be justified, particulars of the imports from or re-exports to British countries as a whole and foreign countries as a whole are shown. Between these two main tables there is a table giving particulars of the home consumption of each description of dutiable goods imported. Volume III deals exclusively with British exports, and contains particulars similar to those given in Volume II in respect of imports and re-exports.

The chief part of Volume IV consists of tables showing (1) the trade of the individual ports of the United Kingdom, distinguishing the principal articles or groups of articles imported or exported; and (2) the trade of the United Kingdom as a whole with individual countries, distinguishing the principal articles or groups of articles imported from or exported to these countries. The amount of detail given is not very large, but further details are easily secured by combining the information given in these tables with that contained in the detailed tables in Volumes II and III.

The Monthly and Annual Trade Returns are compiled by the Customs and Excise Department. The list of commodities in respect of which information is collected and published, and the countries which are included for each commodity in the Returns, are revised annually by a Committee representative of the Board of Trade Statistical Department and the Customs Statistical Office, subject to the approval of the Board of Trade, the Board of Customs and Excise, and the Treasury. The Returns were greatly expanded in 1920 in consequence of an extensive revision made on the initiative of the Board. The particulars of external trade, therefore, appear in much greater detail now than before the war.

Articles now appear in the Board of Trade Journal dealing with the Trade Returns as follows :—

- (i) Monthly : The external trade of the United Kingdom is reviewed. The January review covers the preceding year ;
- (ii) Quarterly : The overseas trade of the expired months of the current year is revalued on the basis of values current in the corresponding periods of the preceding year and the year 1924, so that changes of volume and of average values may be determined.
- (iii) Quarterly : The geographical distribution of our overseas trade is analysed and compared with that in preceding periods ;
- (iv) Annually : The balance of trade of the year is estimated ;
- (v) Annually ; The export trade in cotton-piece goods in comparison with that of previous years is reviewed.

Substantially, these articles represent a post-war development of the Board's statistical activities, although, during a decade before the war, a White Paper was issued annually which dealt with the question of the volume as distinct from the value of trade.

#### *Customs Bill of Entry.*

Advance information as to the import and export trade at most of the principal United Kingdom ports is available to subscribers to the printed Customs Bills of Entry. These Bills are published daily at London, Liverpool and Hull, and thrice weekly at Glasgow.

Special accounts giving more detailed particulars as to imports and exports of articles than appear in the published accounts of trade, or information in advance of the particulars published in the annual statement of trade, are obtainable through the Bill of Entry Branch of the Customs and Excise Department on payment of appropriate fees. Greater advantage is taken of this facility for obtaining special information than was the case before the war.

(b) *Industrial production statistics.*—These are represented mainly by the results of the Industrial Census of Production. As the

Second Census (in respect of 1912) was not completed owing to the outbreak of the war, for many items it is possible to compare only the First Census (1907) with that of 1924 (the Third), Preliminary Reports on which appeared as Supplements to the Board of Trade Journal during 1927. The particulars of output which the Board are authorised to obtain as regards quantities are compulsory only to the extent to which corresponding details are required in respect of goods imported or exported. It follows, therefore, that the expansion of the Import and Export List referred to above has had the effect of increasing the amount of data obtained by the Census. More detail has been obtained in other directions also.

The information in the Preliminary Reports on the 1924 Census covers the quantity (where recorded) and the value of the various products of firms making returns on the schedules for the individual trades, together with the corresponding figures of net imports and exports (so far as available), the cost of materials, the amount paid for work given out to other firms, the value of the net output, the numbers of persons employed and the capacity of the engines and electrical generators at the factories and of electric motors driven by purchased electricity. The Final Reports on the Census will co-ordinate the particulars published in the Preliminary Reports, and will contain much information of a more general character in part based on voluntary information as to fuel consumption, further details of output, machinery used, etc. The final results of the 1907 Census make it possible for the first time to measure the values created by the industrial activities of the country and to compare its different industries on the basis of those values. It was found possible to compare the industrial production of the country with the value of the services rendered by transport and commerce, and a basis was established, alternative to that of the income tax returns, for estimating the national income of the country. The results also furnished a means of determining the relative and also the absolute importance of the different kinds of goods which constitute the material income of the country. Information was deduced from the returns with regard to national savings and the relation of the country's foreign trade to its industrial production for home consumption. The Final Report of the 1924 Census will contain material for extended knowledge on these subjects. It is hoped, in addition, to include regional surveys of production in certain large and important industrial districts, together with some information on the relation of wages to net output in the principal industries or groups of industries and on the variation of net output with the size of establishments.

The date of the Fourth Census has not yet been determined, but arrangements are being made to obtain information at short intervals from trade associations or representative firms in the leading industries which will enable an Index of Production to be constructed that

will register current changes of the industrial output in an intercensal period. This is an entirely new development.\*

(c) *Navigation and shipping statistics.*—The "Annual Statement of Navigation and Shipping of the United Kingdom" has been very much condensed since 1921, mainly by the grouping of particulars relating to countries from which vessels arrived and to which they departed, and by the elimination of minor details from the particulars relating to specific ports in the United Kingdom.

The Annual Statement of the Navigation and Shipping of the United Kingdom is divided into three sections: (1) Introduction and abstract tables; (2) detailed tables for the latest year; (3) comparative tables for the last five years. Each of these sections contains tables dealing with the following subjects:—The number, nationality and tonnage of vessels arriving at, and departing from, the ports in the United Kingdom (a) in the foreign trade, (b) in the coasting trade; the number and tonnage of vessels on the registers at the ports of the several divisions of the British Empire, and the ages of the vessels on the Register of the United Kingdom; the number and tonnage of vessels belonging to the United Kingdom returned as employed, and the number of persons employed therein; and shipbuilding in the United Kingdom.

Prior to the war, the "Return of Shipping Casualties and Loss of Life," issued annually, was a large publication (147 pages in 1914), but this volume and the "Return of Deaths of Seamen and Fishermen" (94 pages) are now represented by the severely contracted "Return of Shipping Casualties to and Deaths on Vessels registered in the United Kingdom" (11 pages in 1927), which, it is thought, contains all the most useful part of the information previously published in more extended form.

An Annual Blue Book, "Tables Showing the Progress of Merchant Shipping in the United Kingdom and the Principal Maritime countries," was discontinued on the outbreak of war, and its publication has not been resumed.

A "Census of Seamen" was taken quinquennially before the war. A similar Census was taken in 1921, but it has since been decided that in future full details will only be obtained decennially at the same time as the Census of Population, and that for the intermediate Censuses less detail is necessary. The results of the 1926 Census were thus presented in an eight-page supplement to the Board of Trade Journal. The annual Employment Returns of Shipping and Seamen for 1926 have also been co-ordinated with the Census of Seamen for that year, and will be obtained in subsequent years in the improved form thus introduced.

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\* The proposal to undertake the compilation of the Index of Production here mentioned was examined and approved by the Committee on Industry and Trade. Their views and suggestions were embodied in a memorandum forwarded to the President of the Board of Trade on 21st July, 1926. See Appendix, page 297.

(d) *Passenger movement and migration statistics.*—Before the war, Annual and Monthly Reports on migration were made in the form of White Papers (that in respect of the year 1913 had 59 pages). Both reports were discontinued at the beginning of the war, and they have now been replaced by quarterly and annual reports which are published in the Board of Trade Journal. The pre-war White Papers are distinguished from the statements now published mainly by more detailed presentation and by the inclusion of comparative figures for a long period of years, but in some respects (for example, the occupations of emigrants, and the passenger movement from and to the Irish Free State) the present statistics are shown in greater detail than was the practice with the older ones.

(e) *Miscellaneous commercial and economic statistics.*—These statistics are made public mainly through periodical articles in the Board of Trade Journal. Monthly articles deal with:—

- (i) The course of wholesale prices. The Board of Trade Wholesale Price Index was calculated anew after the war on the basis of the prices of 150 articles (in place of the 45 adopted before the war), and is issued monthly. The pre-war index number was published annually.
- (ii) Wholesale prices in France, Germany, Belgium and Italy, as shown by the index numbers compiled in those countries.
- (iii) The production and wholesale prices of Coal, Iron and Steel in certain European countries and the United States of America as compared with the United Kingdom.
- (iv) The movements of the foreign exchanges.

Like the articles in the Board of Trade Journal dealing with the Trade Returns, these articles constitute substantially a post-war development.

On the other hand, a number of series of "White Papers" summarising at intervals of one or more years known particulars of production, consumption and trade relating to important commodities (coal, iron and steel, tea and coffee, and alcoholic beverages), which were issued before the war, were discontinued on its commencement, and one only, "Coal Tables," has been re-issued (in respect of 1924, published 1925). "Iron and Steel, 1912" (issued in 1914), contained an expository memorandum covering a good deal of the history of the industry; in part, the reports and statistics of the National Federation of Iron and Steel Manufacturers may be regarded as taking the place of this "White Paper."

Statistics concerning cotton (by kinds and bales) were summarised in a monthly statement of imports, exports and forwardings to inland towns under the provisions of the Cotton Statistics Act of 1868, but the Act was repealed in 1923, as, on the one hand, owing to the increase of road traffic, the information had become incomplete, and, on the other, the Liverpool Cotton Association's published

statistics of deliveries to mills were so comprehensive as to render the official record unnecessary. The official statistics, which were lithographed for a small circulation and reproduced in the Board of Trade Journal, have, therefore, been dropped.

The Annual Return relating to Gas Undertakings (issued in two parts) has been rearranged, and the technical data in it have been amplified.

(f) *Statistical abstracts*.—Prior to the war, the following abstracts were published annually :—

- (i) United Kingdom.
- (ii) Overseas Dominions and Protectorates.
- (iii) British Empire.
- (iv) Foreign.

In addition, a large volume of Colonial Statistics (876 foolscap pages in the issue relating to 1912) was published annually, and a summarised version of the Trade Returns of the principal Foreign and British Overseas Countries was issued monthly.

These six publications have now been reduced to three, viz., the Statistical Abstract of the United Kingdom (annual), the Statistical Abstract of the British Overseas Dominions and Protectorates\* (recently every other year) and a summary of the Trade Returns of certain Foreign and British Countries, issued quarterly instead of monthly.

The form and scope of the United Kingdom Abstract was considered in 1926 by the Permanent Consultative Committee on Official Statistics and, as a result, the latest issue, that covering the period 1911–25, was recast and expanded in scope; it included more labour, vital and financial statistics, while the trade figures were condensed as compared with previous issues †. Previously the Board of Trade were solely responsible for the United Kingdom Abstract, but since its revision it appears as compiled by the Board of Trade in conjunction with the Ministry of Labour and the Registrars-General.

The “Dominions” Abstract is in substantially the same form as before the war; it is devoted largely to trade statistics, although demographic, production, financial and other data are included. The British Empire Abstract, which was devoted almost wholly to the production, trade and shipping of the constituent parts of the Empire (including the United Kingdom), was discontinued on the outbreak of war, and its revival is not contemplated in view of the intended inclusion in the “Dominions” Abstract of further figures

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\* The scope of this publication extends to all British countries overseas.

† Volume I of the “Annual Statement of Trade,” as issued first in 1920, includes a full summary of the trade figures, although five years only are covered, as compared with the fifteen-years’ period in the “Abstract.”

summarising inter-Imperial trade, etc. In accordance with the views of Imperial Conferences, data relative to the United Kingdom will also be included comparable with those relating to the Dominions, and the "Dominions" Abstract is tending to become a summary of "Empire" statistics (see page 294). In the near future further developments in this direction are anticipated.

The "Foreign" Abstract, which has not been re-issued since its suspension in 1914, was a useful compendium, covering a wide range of items in addition to trade. It has been largely replaced, however, by the publications of the League of Nations.

Reference should also be made to the "Statistical Tables and Charts relating to British and Foreign Trade and Industry," published in 1903, 1904, and 1909, although these publications did not constitute a regular series of the character of those under review. The last of these volumes was prepared in a form which was adapted to re-issue at convenient intervals, with particulars revised to date, but no such re-issue had been made when the war broke out, and no similar publication has been issued by the Board of Trade since the war.\*

Generally speaking, it may be taken that, although a number of items have been suppressed, the data appearing to-day in the Board's publications are in essentials as complete as, and in some respects fuller than, before the war. The Trade Returns in particular have been amplified considerably, and while some other information, notably that concerned with Navigation and Shipping, has been condensed into a more summary form, this seems to meet sufficiently, and in some respects more effectively than formerly, the statistical requirements of those interested. The rearrangement of the statistical material which has taken place since the war may be attributed largely to the co-ordination resulting from the concentration of statistical work in one Department of the Board, and also to the opportunity provided by the new set of conditions following the war, which made a revision of the pre-war statistical publications necessary or at least very desirable. As has been indicated, several publications were suspended as a result of the outbreak of war, and the break in continuity afforded a special occasion for the reconsideration of the merits of each after the war was over.

#### Mines Department.

Previous to the war the collection and publication of statistics of mining and quarrying were chiefly carried out by the Home Office, but special enquiries were undertaken, either regularly or

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\* To some extent the publications of the Committee on Industry and Trade may be regarded as a post-war counterpart of the pre-war series referred to.

occasionally, by other departments. During the war and post-war period considerable developments took place in the collection of information relating to the mining industry, and statistics were collected and published by the Home Office, the Statistical Department of the Board of Trade, the Ministry of Labour, and the Coal Mines Department. In 1920, the Mining Industry Act was passed setting up a Mines Department of the Board of Trade with the object of concentrating in one Department all the functions of the Government in relation to the mining industry. This step has enabled the question of mining statistics to be reviewed as a whole and in consultation with the Advisory Committees which were required to be appointed under the Act. The result has been that more information is available in regard to the mining industry, and particularly the coal mining part of it, than was the case before the war, and the information is published at shorter intervals.

#### *Coal mining.*

In pre-war days certain information regarding output, persons employed, accidents, rescue brigades, explosives, plant and equipment, prosecutions, etc., was compiled by the Chief Inspector of Mines and published annually in three parts, the last of which did not appear until the end of the year after that to which the information related. Preliminary statements of accidents and output were, however, issued in advance of the annual report. Divisional statistics were also published in the Divisional Inspectors' Statutory Annual Reports.

An annual report is now published, in one volume, which comprises the reports of the Secretary for Mines and the Chief Inspector of Mines. The Coal Advisory Committee attach great importance to the continuity of records where these serve a useful purpose, and in consequence practically all the statistics published before the war are still continued either in the annual report of the department or in the reports of H.M. Divisional Inspectors. In addition to a statistical appendix giving information in a very convenient form and a number of charts showing the progress made by the industry over the last 50 years, the report of the Secretary for Mines now deals systematically with every aspect of the mining and quarrying industries. The annual report also reproduces a feature of the return of "Coal Shipments," issued periodically by the Customs before the war and since discontinued, showing the quantity of coal exported to groups of destinations from each group of British ports. In addition, improvements have been effected in the statistics relating to the distribution and consumption of coal and in the methods of measuring the frequency of accidents. It is now possible to measure the relative frequency of accidents in considerable detail by district, occupation and age, and to show the nature of the injuries resulting from non-fatal accidents and the period of disablement. An

important addition to the statistics as compared with those published before the war is the quarterly return of costs of production, proceeds, profits of the industry (including output figures and earnings per shift).

A part of the Chief Inspector's report, dealing with foreign and colonial statistics, was suspended during the war, and in 1919 the Home Office handed over the work to the Imperial Mineral Resources Bureau (now merged in the Imperial Institute), and that body issues a yearly volume of British Empire and Foreign mineral statistics. As is stated above, a White Paper, "Coal Tables," summarising particulars of the production, consumption and trade in coal, which was issued at intervals before the war, was re-issued in 1925. This publication deals with the chief coal producing and consuming countries of the world.

The Divisional Inspectors' reports are still published annually.

In addition to the foregoing, the department supplies the following information for publication:—

- (1) Weekly figures of the days worked by the mines and days lost from various causes (Ministry of Labour Gazette). These figures have taken the place of less extensive information previously collected by the Ministry of Labour.
- (2) Monthly figures of the number of accidents (Ministry of Labour Gazette).
- (3) Weekly figures of output and persons employed (Board of Trade Journal).
- (4) Quarterly review of the Coal Mining Industry (Board of Trade Journal).

#### *Metalliferous mines and all quarries over 20 feet deep.*

In pre-war days information was collected by the Home Office and published annually in the Chief Inspector's report. Figures were given of the output and value of minerals, persons employed and accidents, explosives, etc. On the recommendation of the Advisory Committee for the Metalliferous Mining and Quarrying Industry, a quarterly statement summarising the figures of output, value of mineral, and employment at metalliferous mines and quarries, and showing the trend of selling prices of certain metals during the quarter, was issued in 1922 and still continues. Other statistics, including those of accidents, are still collected and published annually.

Statistics of production, employment and accidents at other mines and at quarries more than 20 feet deep are published annually as before the war, and information is now available with regard to the plant used at these mines and quarries. A considerable improvement has recently been introduced in the statistics of output of the more widely distributed minerals, and these now show the uses to which these minerals are put.

### Ministry of Labour.

The Ministry of Labour is one of the Departments provision for which was made by the New Ministers and Secretaries Act, 1916. It was actually set up in 1917, and in respect of statistical as well as other work took over functions which had been carried out up to that time by the Board of Trade.

The differences in the position of Labour Statistics to-day as compared with before the war vary as between the several branches. The position in each section is as follows.

#### *Employment.*

Before the war the monthly statistics and reports on the state of employment, which have been a feature of the "Labour Gazette" (now called the "Ministry of Labour Gazette") from its inception in 1893, covered 35 industries. In July, 1922, the number was reduced to 13 for reasons of economy. Subsequently four of the industries were reinstated and the number is now 17. Monthly returns which had been regularly collected from representative employers in many industries, showing the variations from month to month in the numbers of workpeople employed and in the amount of wages paid, were discontinued in the case of those industries the reports on which were omitted, with the result that the total number of workpeople in respect of whom such statistics were obtained was reduced from over 430,000 to about 200,000. Such information as is still available with regard to industries other than those on which individual reports are given is incorporated in the general article on the state of employment which prefaces the Industry articles, but this only goes a little way towards filling the gap. On the other hand the information given upon some of the 17 industries still dealt with in detail has been supplemented by statistics now available, which could not be given before the war, regarding unemployment among insured workpeople. In the coal mining industry voluntary returns supplied before the war relating to the numbers of workpeople employed and number of shifts worked at pits covering about two-thirds of the industry have been replaced by statutory returns supplied to the Mines Department covering the whole industry. In the case of the woollen industry the active co-operation of the Wool (and Allied) Textile Employers' Council has enabled monthly statistical returns to be obtained from a very much larger number of employers, with the result that the information presented has been greatly amplified and placed on a much more representative basis. In certain other industries, notably the cotton trade, the statistics based on employers' returns are less representative than before the war.

#### *Unemployment.*

The information now compiled and published regarding unemployment is much more voluminous, comprehensive and informative

than before the war. This has been made possible in the main by the extension of the scope of unemployment insurance.

In addition to the detailed statistics which are now given monthly in the "Ministry of Labour Gazette," showing the numbers and percentages of insured persons unemployed in each of 100 industrial groupings, much information on the condition of the unemployed has been given in special reports based upon the examination of a small sample of the cases under review. Two Reports on the Personal Circumstances and Industrial History of unemployed insured persons were published in 1924 and 1925 respectively and a third is in preparation. A similar Report on unemployed boys and girls was published in 1926, and a Report on the Insurance History of a sample of all Insured Persons was issued in 1927.

At the beginning of 1927 a Local Unemployment Index showing the percentages unemployed among insured workpeople in each of 637 towns and districts in Great Britain was instituted on a subscription basis and is issued monthly.

The publication in the "Ministry of Labour Gazette," of the series of percentages of unemployment among members of certain trade unions, which before the war provided the principal indication of the extent and trend of unemployment, was recently discontinued, on the ground that the Unemployment Insurance statistics had made the trade union figures of negligible importance by comparison.

#### *Cost of living.*

The information in the "Ministry of Labour Gazette" regarding the monthly changes in average retail prices is much more comprehensive and representative than was given before the war. On the other hand, there is no recent information concerning the relative levels of cost of living in different towns such as that which was obtained in 1905 and 1912 and published in special reports. Also there is no up-to-date information regarding the family budgets of the working-classes such as that obtained in 1904. During 1927 the Minister of Labour consulted the National Confederation of Employers' Organisations and the Trades Union Congress General Council, and found that they were each of opinion that the moment was not propitious for making a new inquiry into working-class family budgets. An enquiry into the relative cost of living in the various towns and districts of the country cannot well be made until up-to-date information is available as to family budgets.

#### *Wages and hours of labour.*

The information collected and published monthly in the "Ministry of Labour Gazette" regarding changes in rates of wages and hours of labour is in general on the same basis and scale as before the war. Some reductions, however, are proposed in the volume of this information and in the statistics compiled therefrom, to which reference is made below.

In the matter of periodical reports in volume form, and of special enquiries, less is issued to the public than before the war. Then, reports on Changes in Rates of Wages and Hours of Labour during the year, and on Standard Time Rates of Wages at a particular date, were issued annually. Since the war, only one volume on Standard Time Rates has been issued (in 1921)\* and none on changes in Rates of Wages and Hours of Labour.

In 1924 an inquiry into Average Earnings and Hours of Labour in the principal industries was undertaken coincidently with the Census of Production, and the results of that enquiry have been published in the "Ministry of Labour Gazette." The enquiry did not, however, distinguish between the various occupations within the industries, and no comprehensive information as to occupational rates of wages and earnings, or as to the range and distribution of weekly wages, such as was collected by the Board of Trade in the Earnings and Hours Enquiry of 1906-07, is now available for any recent year, except as regards the distributive trades, for which a series of enquiries were made into earnings and hours in 1924-25 for purposes connected with the administration of the Trade Boards Acts.

It is intended to make an annual sample inquiry into average earnings and hours in the principal industries which will serve to bring up-to-date the information obtained in 1924, the first of these enquiries being planned to take place in the spring of 1928. It is also hoped to begin in 1928, or as soon thereafter as practicable, a rotational census of Occupational Time Rates, Earnings and Hours, which will proceed industry by industry over a cycle of 10 years, and provide information comparable with that obtained by the Earnings and Hours Enquiry of 1906-07; it is proposed that the cost of this census shall, in the main, be counterbalanced by reductions in the collection of information and compilation of statistics as to changes in rates of wages and hours of labour referred to above.

#### *Other statistics.*

As regards trade disputes and the membership, etc., of trade unions, the information at present collected and published in the "Ministry of Labour Gazette" is on much the same scale as before the war, but the issue of periodical volumes from which the recent history of disputes and trade unions can be studied is much in arrear, no volumes on these two subjects having been published since before the war. Sanction has recently been obtained for the issue of a volume on trade unions, and the preparation of this volume has now been put in hand, but the annual reports on trade disputes are still suspended. As regards profit-sharing and labour co-partnership, information is regularly obtained corresponding with that collected before the war; although no report in volume form has been issued

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\* A new edition of this volume is to be published in 1928.

since 1920, the principal statistics are revised and published annually in the "Ministry of Labour Gazette."

A series of reports on Apprenticeship and Training for Skilled Occupations in the principal industries, based on the results of special enquiries which have recently been made, are in preparation. The first of these reports, relating to the Printing and Allied Industries, was issued in October, 1927; a second volume, relating to the Building, Woodworking, and Allied Industries, and a third, relating to the Mining and Quarrying, Metal Extraction, Chemical, Glass, Pottery and Allied Industries, were published in January, 1928; and further reports, dealing with other groups of industries, are planned to follow shortly. In 1914 a report embodying the results of similar enquiries was prepared, but was not published owing to the outbreak of the war. A revised edition of the report on Collective Agreements between Employers and Workpeople, published by the Board of Trade Labour Department in 1910, is now being compiled. A "Dictionary of Occupational Terms," containing a descriptive glossary of the occupations returned by workpeople on Census of Population schedules was published in October, 1927; no similar volume was available before the war. The Abstract of Labour Statistics, published annually before the war, containing an ordered retrospect of information on labour matters, was suspended from 1915 to 1926, but in the latter year a new edition was issued, and sanction has been obtained for the publication of a further issue in 1928.

#### Ministry of Transport.

The Ministry of Transport was established in 1919, and in respect of statistical as well as other work took over functions previously performed by the Board of Trade. The scope of the statistical information published by the Ministry represents, on the whole, a great increase as compared with what was issued up to 1913, many of the returns, including all those issued by the Electricity Commissioners, being actually new since the war. To a considerable extent the new statistical returns of the Ministry of Transport relate to motor vehicles and roads, and reflect the increased importance of these subjects as compared with pre-war years. The compilation of certain port statistics has been discontinued as a matter of economy, but these statistics were not in any case instituted until 1920.

The regular periodical statistics published by the Ministry of Transport which are relevant to the present enquiry are discussed in the following paragraphs.

*Annual railway returns.*—The passing of the Railway Companies (Accounts and Returns) Act, 1911, which took effect in 1913, involved fundamental changes in the form in which companies working a railway were required to submit their accounts and statistics. The present financial statements are based on the schedule to the Act

of 1911. The statistical returns have been reorganised and expanded under powers obtained first under the Ministry of Transport Act, 1919, and now derived from the Railways Act, 1921. Important basic statistics which are new since the war are those relating to commodities conveyed by freight train, net ton-miles of freight, wagon-miles, passenger-miles, train and engine-hours, and traffic conveyed by canals. In addition, improved information is afforded of train and engine-mileage, wagon stock and other items. Compared with the returns published for 1913, the statistics are of greater value and interest to the industrial and commercial community, and attention may be drawn to the following data which are of special importance in this connexion :—

Average freight train-load.

Average wagon-load of freight.

Average length of haul of freight.

Average receipt per ton-mile of freight.

Commodity statistics.

Average length of haul.

Average receipt per ton-mile.

Average number of train-miles run per train-hour, and per engine-hour.

Net ton-miles of freight per engine-hour.

All the items in this list are derived from the entirely new basic statistics first obtained in 1920.

The publication which contains these returns remains annual, as before the war, but the amalgamation of the railways and revision of the mode of presentation have reduced the size of the publication in spite of the increase in information. A valuable new feature of the volume is the insertion of consolidated figures for each of the four amalgamated companies for the year 1913, obtained by an aggregation of the returns of the separate companies now comprised in the new groups.

The summary tables for decennial and other periods ending 31st December, 1912, which appeared in the annual railway returns for 1913 were omitted from the returns for 1919 and subsequent years. The reason is that the figures which they contained were not properly comparable with those for the years 1913 onwards, in consequence of the changes brought about by the Railway Companies (Accounts and Returns) Act, 1911. Their place has been taken by summary tables for 1913 and the five years ending with the year to which the returns relate, e.g. the returns for 1926 contained a summary table for the years 1913 and 1922 to 1926 inclusive.

*Monthly railway statistics.*—These statistics are entirely new since the war. Instituted in January, 1920, they are now based on the 8th Schedule to the Railways Act, 1921. In addition to most of the data mentioned in the preceding paragraph, the monthly statistics

also contain, *inter alia*, particulars of work performed in selected marshalling yards, cartage statistics and tonnage dealt with and cost of working at selected goods depots.

*Annual census of railway staff.*—Prior to the war a triennial statement of the numbers of railway employees was published, but an annual return is now obtained under the Act of 1921, which contains both new items and old items in amplified and improved form. Particulars are now furnished by all railway companies for a selected week in each year, showing the total number of staff employed in each of the principal grades, and the average salary or wage and average weekly earnings of certain selected grades.

*Annual returns of tramways and light railways.*—The information contained in these returns is obtained annually under an Order of the House of Commons. Commencing with the issue relating to the year 1924-25, the scope of the returns has been increased and improvements have been made in the method of presentation of the data furnished.

*Annual reports on the administration of the Road Fund.*—These reports are in continuation of the annual reports of the Road Board on the Administration of the Road Improvement Fund, issued from 1910 to 1918 and give such information as:—

- (a) Receipts and payments of the Road Fund ;
- (b) Grants made to local authorities ;
- (c) Total expenditure on the maintenance, improvement and cleansing of roads and bridges ;
- (d) Taxation of road vehicles—gross receipts and number of licences issued ;
- (e) Registration and licensing of mechanically propelled vehicles —approximate number of licences current at various dates ;
- (f) Classification of roads—schedules of mileage ;
- (g) Estimated revenue of the Road Fund for the following year and statement of the purposes to which it is proposed to make grants during that year.

Compared with the reports of the former Road Board it has been necessary largely to extend the scope and to make substantial alterations in the nature of the reports.

*Quarterly returns of motor taxation and licences current and of newly registered motor vehicles*—These returns are new since the war and show the amounts derived from the issue of licences for mechanically propelled vehicles, together with estimates of the number of licences current at the end of each quarter. This publication also includes statistics as to the number of vehicles newly registered in each taxation category during the period covered by the return.

*Periodical traffic census, class I and class II roads.*—These returns are new since the war. They relate to the volume of traffic passing selected points on certain roads, during a week in August, and also indicate by means of applied factors the weight of vehicular traffic using the roads. Separate returns have been issued for class I roads for 1922 and 1925, and for class II roads for 1923. Returns in respect of class II roads for 1926 were included in the annual report on the administration of the Road Fund for that year, and it is proposed that in future the returns in respect of each of the two classes of roads mentioned should be issued triennially in the same way.

*Census of mechanically propelled vehicles.*—This return, which has great administrative value, was first instituted in 1926, and shows the number of vehicles bearing current licences during the quarter ended 30th September under the various taxation categories and sub-categories, e.g. the number of cars taxed on horse-power is sub-divided to show the number of such cars at each horse-power, the number of motor goods vehicles at each tonnage step in the taxation scale is shown separately, and hackney vehicles (which include taxi-cabs, omnibuses, and chars-à-banc) are sub-divided according to seating capacity.

*Publications of the Electricity Commissioners.*—These publications are new since the war and consist of the following volumes:—

- (a) *Annual reports of the commissioners.*—The reports include summarised particulars of (1) the number of authorised undertakers, (2) the generation and consumption of electricity, (3) the capacity and amount of new generating plant sanctioned each year, (4) the number, amount and purpose of loans sanctioned for electricity purposes in the case of local authorities, etc.
- (b) *Generation of electricity in Great Britain.*—Annual returns of the units generated and fuel consumed at generating stations in Great Britain, in detail.
- (c) *Electricity supply undertakings.*—A return of authorised undertakers in Great Britain and administrative particulars of undertakings was issued by the Electricity Commissioners as at 31st December, 1923. A revised volume is in preparation.
- (d) *Electricity supply.*—Returns of engineering and financial statistics relating to electricity supply. Returns relating to the years 1920 to 1923 were published in May, 1925, and returns for the years 1924-25 in September, 1926. Similar returns for subsequent years are in course of preparation. The returns comprise individual as well as summarised details of (1) an engineering character relating to systems of supply, plant installed; maximum loads;

total connexions ; fuel consumption ; units generated, purchased and sold ; average consumption per head of population in the area of supply ; and (2) a financial character relating to capital raised and expended ; revenue from working ; working expenses ; surplus and appropriations. The return also gives comparative figures under numerous heads between undertakings operated by local authorities and companies respectively.

### The Registrars General.

#### *England and Wales.*

The regular periodical statistics published by the Registrar General for England and Wales consist of —

Decennial Census of Population.

Decennial Supplement (i.e. statistics based on combination of censal and inter-censal material)

Annual "Statistical Review" (previously "Registrar General's Annual Report").

Quarterly and Weekly Returns.

These are all, on the whole, more comprehensive and adequate than in the five years preceding the war, by reason of their including new items and old items in an improved and enlarged form. Precise comparison in the case of census reports is not easy in view of the fact that the inquiries dealt with at one census may differ materially from those included in another. But the scope of the 1921 census was definitely more ample than that of any preceding census ; by way of illustration it may be mentioned that in 1921 a complete dual tabulation of the population by both occupation and industry took the place of the single tabulation of 1911 on a mixed occupational and industrial classification. Again, tabulation by nationality was added to that by birthplace. Another new feature in 1921, was the inclusion of certain subjects never previously attempted, as, for example, the "work-place" and "dependency" inquiries. As regards omission of international statistics, see page 296.

The contents of the weekly, quarterly and annual returns are as follows :—

*Weekly return*—Weekly numbers of births and deaths (distinguishing those from certain epidemic diseases and also deaths of infants) in all county boroughs and great towns in England and Wales and in certain colonial and foreign cities, notified cases of certain infectious diseases in each administrative area in England and Wales, and certain meteorological data for London and other large towns.

*Quarterly return.*—Registered births, deaths and marriages in England and Wales and constituent counties and quarterly summaries of the principal tables appearing in the weekly return, with an additional table of vital statistics for a group of smaller towns in England and Wales with populations exceeding 20,000 persons at the last census.

*The Statistical Review.*—*Part I, "Medical,"* shows deaths in England and Wales analysed by sex, age, cause and month of occurrence with lesser detail for the several administrative areas, notified cases and case-rates of notifiable diseases, and serial tables of mortality-rates for successive quinquennia and decennia.

*Part II, "Civil,"* gives estimates of population for the United Kingdom and its divisions, birth and marriage abstracts and parliamentary and local government electors in England and Wales, migration, vital statistics of the Dominions, and tables of changes in boundaries of administrative and poor-law areas. In addition, a separate volume contains a report on the statistics contained in Parts I and II.

The annual, quarterly and weekly publications are revised decennially—not more frequently owing to the necessity of maintaining comparable tabulations throughout each decennium for the purposes of the Decennial Supplement. At the last revision in 1921 these publications were substantially reconstructed and amplified in scope. For example, tabulations of notifications of infectious diseases have been included and developed in all three series, while statistics of the electorate have been made a substantial feature of the annual publication.

Certain items have been curtailed or omitted, but solely on consideration of their relative interest and value, and in no case as a definite sacrifice to retrenchment. In some cases the annual publication of such items has been replaced by quinquennial publication as sufficiently satisfying public requirements. In the reconstruction of the Annual Report which transformed that publication into the Registrar-General's Statistical Review, economies were effected through the re-casting of tables and the observance of a juster perspective of the relative importance of particular items, in order to find room for inserting the additional matter without lessening the value of the publication.

#### *Scotland.*

The Registrar-General for Scotland states that the report on the census of 1921 and the periodical reports and returns issued by him are as comprehensive and adequate as those issued in the years preceding the war. Many minor changes and improvements have been introduced.

### Department of Overseas Trade.

No memorandum discussing the changes which have taken place since 1913 affecting the supply of official information on commercial subjects would be complete without reference to the Department of Overseas Trade. The department represents a policy of specific assistance to those engaged in exporting British goods which has been taking shape for some thirty years. It was founded as the result of a demand on the part of exporters for a department whose appointed action should be, not to administer statutes and make regulative or restrictive orders, but to assist them in their trading activities, and thus be in a special sense their own. Its function is to furnish exporters of British goods with information regarding overseas markets, and to further their individual commercial interests and those of their representatives abroad (as well as the wider commercial interests of the country at large). The department endeavours to assist those who are engaged in selling British goods by placing an intelligence service at their disposal if they wish to use it. For this purpose, it proceeds, broadly speaking, by circulating commercial intelligence gathered from a network of commercial intelligence officers overseas to manufacturing and exporting firms in this country, and by undertaking through its officers overseas specific inquiries or other pieces of work at the request of exporting firms or of organisations representing the corporate interests of bodies of exporters.

Up to 1917 the Foreign Office and the Board of Trade had shared the responsibility for the collection of commercial intelligence, since officers dealing with commercial matters in foreign countries were controlled by the Foreign Office, while the Trade Commissioner service within the British Empire was controlled by the Board of Trade. Difficulties arising from this duality of control, and the demand of the commercial community for the re-organisation and enlargement of the then existing system, resulted, after lengthy enquiries, in the setting up in 1917 of the present department as a joint department of the Foreign Office and the Board of Trade. The department combines the work of the old Commercial Intelligence Branch of the Board of Trade and much of that of the Commercial Department of the Foreign Office. The former was established in 1899 as the result of a Departmental Committee of Inquiry, whilst the latter was some twenty or thirty years older. The department now controls three overseas services whose function is to provide commercial intelligence, namely, the Commercial Diplomatic, the Consular and the Trade Commissioner services. The Commercial Attaché service was started in 1880 by the appointment of a single Commercial Attaché with all Europe for his province. In 1887 the number of Commercial Attachés was increased by the appointment of a second, who was put in charge of British commercial interests in Russia, Persia and the Asiatic Provinces of Turkey. Additional appointments were made from time to time, and in 1907 fresh

arrangements were introduced, so that on the outbreak of war in 1914 a system of Commercial Attachés had been established on a small scale embracing eight officers. Trade Commissioners, four in number, were first appointed in the self-governing Dominions in 1908 as the result of discussions at the Imperial Conference of 1907. An increase was made to 13 after the report of the Dominions Royal Commission in 1917 and in consequence of a resolution of the Imperial War Conference in that year. After the war the Commercial Attaché service, now called the Commercial Diplomatic service, was largely expanded under the control of the Department of Overseas Trade, and the administration of the Consular service was entrusted by the Foreign Office to the department in October, 1919. There has thus been created a system of unified control over all the commercial services abroad through a joint department with a separate vote. This system abolishes the many anomalies of control and machinery that existed before the war, and secures that the services can be administered on similar lines, in especial it enables the Commercial Diplomatic service and the Consular service to receive control and guidance in commercial matters from a professedly commercial department.

In the Empire at the present time there are 13 Trade Commissioners at work, covering Canada and Newfoundland (3), Australia (2), New Zealand (1), South Africa (2), India and Ceylon (3), East Africa (1), and the British West Indies (1). At a few of the most important centres the Trade Commissioners have the assistance of paid Imperial Trade Correspondents (5 in all); and the Department also enjoys the gratuitous services of over 50 Honorary Imperial Trade Correspondents, mostly Dominion and Colonial Government officials in various parts of the Empire.

The Commercial Diplomatic service supersedes the handful of Commercial Attachés who existed in pre-war days. There are 32 officers in the service stationed in all the more important foreign countries.

Consular officers are established in all foreign countries. There are at present over 900 Consular Officers and over 700 posts (important posts are, of course, staffed with more than one salaried officer). The duties of the Consular service, naturally, are multifarious, but of recent years commercial intelligence has, in pursuance of the deliberate policy of successive Governments, been given a more prominent place in the list of consular duties.

The duties of Trade Commissioners and Commercial Diplomatic Officers are in general as follows, so far as the supply of information is concerned :—

To furnish a constant supply of information likely to be of use to British manufacturers and traders on such matters as :—  
 (a) Contracts open to tenders ;  
 (b) Openings for British trade and demand for particular goods ;

- (c) Lists of overseas importers ;
- (d) Suitable agents ;
- (e) Methods of marketing and distribution, credit conditions, terms of payment generally, financial and trade conditions, nature of foreign and local competition, and the best way of combating it ,
- (f) Customs tariffs and regulations, legislation and regulations affecting commercial travellers, patents, trade marks, consular invoices, etc. ,
- (g) Statistics of imports and exports ;
- (h) Shipping and transport ;
- (i) Sources of supply of raw materials and of goods not manufactured in the United Kingdom ;

The officers of the three overseas services also have the duty of dealing with commercial enquiries addressed to them by firms in all parts of the British Empire.

Overseas officers are kept constantly posted on all commercial and industrial developments of importance at home, but in order that their knowledge may be as personal and up to date as possible, a system has been adopted of bringing them home, so far as practicable, in regular rotation, and arranging for them to visit the principal industrial centres. These visits also enable them to give information at first hand to exporters or manufacturers interested in their markets. The visits are arranged in collaboration with Chambers of Commerce, Trade Associations, and similar bodies, and the visiting officer, besides undertaking some hundreds of interviews, avails himself of the opportunity to visit works and factories and to familiarise himself with the methods and products of British manufacturers. The increasing demands made upon the time of overseas officers during these tours are evidence of their utility to the business community.

Trade Commissioners and Commercial Diplomatic Officers also furnish annual reports on the trade, economics and finance of the country to which they are appointed. Generally speaking, the Commercial Diplomatic Officers' annual reports have taken the place of the pre-war Consular reports. The aim of the reports is to give, not so much a detailed narrative of the events of a particular year, as a comprehensive picture of the commercial and economic position at the time of writing viewed in the light of past events, together with an estimate of the outlook for the near future. The reports usually comprise sections dealing with public and general finance ; trade, imports and exports ; industry and production , legislation and administration, especially as affecting trade and industry ; transport ; natural resources ; and social questions as affecting production and trade.

Not only are the reports prepared specifically for the information and assistance of the commercial community of the country (which was not the case with the "Consular Reports" on foreign countries issued before the war), but they are much fuller and more informative than any pre-war reports, and by reason of the increase in the numbers of Trade Commissioners and Commercial Diplomatic Officers, the reports cover all the principal parts of the Empire and foreign countries. Thus the institution of these reports represents a very great improvement on the pre-war arrangements.

In addition to the annual reports, a continuous stream of information is received by the department from the overseas officers, and this is distributed to the interests specially concerned or made public through the press (including the "Board of Trade Journal") as the case may require. The department contributes a very large amount of the material published in the "Board of Trade Journal." The organisation of the department includes tariff, statistical and transport sections whose function is to answer enquiries by traders on these subjects.

#### DATE OF ISSUE OF STATISTICAL PUBLICATIONS.

In many cases the value of statistics is materially affected by the length of the interval between the date to which they relate and the date at which they are published. It is, therefore, important to enquire whether the date of publication of any statistics has been retarded (e.g. on grounds of economy) or has for any reason been advanced. On this point the information given by the departments is as follows.

#### Board of Trade.

As a result of using the "Board of Trade Journal" for the publication of statistical information a large amount of data are now published at short intervals after the period to which they relate and more frequently than would otherwise have been the case.

The monthly accounts relating to trade and navigation of the United Kingdom, compiled by the Customs Department, are now published on the tenth (instead of, as before the war, on the sixth) working day after the month to which they relate, and the annual statement of the trade of the United Kingdom, also compiled by the Customs Department, is published later in the year in order that the work may be more evenly spread. These changes have been made on grounds of economy, as the former earlier publication was only made possible by the extensive employment of overtime. As regards annual publications generally, the date of issue was affected considerably by arrears accumulated during the war period, but the delay has now been mainly overtaken.

*Mines Department.*—The date of publication of the statistics of the Mines Department generally has been advanced.

### Ministry of Labour.

The "Ministry of Labour Gazette," which is the only statistical publication of the Ministry of Labour that has been published since the war at regular intervals, was issued before the war on the 16th of the month, but, with a view to achieving economies in printing costs by the elimination of overtime, the date of publication has in recent years been retarded until the 18th of the month.

### Ministry of Transport.

No publication of the Ministry of Transport has been retarded since the war on grounds of economy. The annual railway returns for 1926 were on sale slightly earlier than the average date before the war. The annual tramway and light railway returns for 1925-26 were published at approximately the same relative date as those before the war.

### General Register Offices.

In the case of the General Register Offices, the date of publication of statistics has in no case been retarded on the grounds of economy.

The weekly date of issue of the "Weekly Return," published by the Register Office for England and Wales, has been retarded but slightly in order to permit of the inclusion of notifications of infectious diseases. By the reconstruction of the annual publication, which converted it from a single volume into an annual series of three parts, the great bulk of the annual statistics is made available to the public four or five months earlier than was ever previously possible.

### THE CO-ORDINATION OF STATISTICAL INFORMATION AS BETWEEN DIFFERENT DEPARTMENTS CONCERNED.

In 1919 a petition was presented to H.M. Government representing the urgent need for the reorganisation of the system of official statistics "as the foundation of a proper system of civil intelligence." This petition, prepared by a Committee of the Royal Statistical Society and signed by a number of statisticians, business men, economists, publicists and many others, and subscribed to by learned bodies, county and municipal authorities, medical officers of health, Chambers of Commerce, and a few companies and firms, alleged a number of defects in the statistics published by Government Departments, and requested a Royal Commission or Parliamentary Committee to inquire into the matter. Among the alleged defects were the absence of any general supervision of national statistics as a whole, a lack of co-operation among the different departments, and defective supervision of the collection of statistics. The petition was referred to a special Committee appointed by the Cabinet, with the Government Actuary as Chairman, and the Committee reported in 1921 that no case existed for the enquiry which was demanded, and that the existence of a central statistical office would give rise to

constitutional and other difficulties and would do little, if anything, to remedy the defects alleged in the petition. They also recommended that a Permanent Consultative Committee consisting of Statistical Officers of selected Government Departments should be set up as an advisory body with the functions of discussing questions affecting statistics, and considering and advising upon any statistical matter referred to it by a Government Department, and with power to make recommendations to any department. This recommendation was adopted and the Committee set up in 1921. In accordance with its constitution it presents an annual report of its proceedings to the Treasury, copies of which are circulated to the departments. The Committee has also been responsible for the publication of a very valuable annual "Guide to Official Statistics," the first issue of which appeared in 1923, and was followed by successive annual issues up to the fifth, the current issue, published in 1927. The Guide provides a means not hitherto available of readily ascertaining what statistics regarding any given subject exist in current official publications.

Use has been made of this Committee by the departments considered in this memorandum; for example, in connexion with the Statistical Abstract for the United Kingdom, the Abstract of Labour Statistics, the annual tables dealing with the deaths of seamen, the annual railway returns and annual returns of tramways and light railways, and the publications of the Registrar General for Scotland. Moreover, a tendency, which was already to be observed before the Committee was set up, has been established in the direction of rendering statistics more uniform, as for instance, in the use of the calendar year as the period whenever this is practicable. There are, of course, limits to the possibility of securing absolute uniformity between different sets of statistical data. Administrative, seasonal, and other peculiar circumstances "lying deep," as has been said, "in the laws and customs of the three Kingdoms," often determine the nature of the information available and the form in which it is presented. For example, remark has already been made, in the Survey of Industrial Relations, page 60, on the differences of classification in the Census returns of England and Wales and of Scotland, and on the resulting difficulties in combining the figures of the two returns. The Census authorities do in fact aim at the presentation of the statistics common to the two countries in such a way that they may be combined, and so far as the 1921 Census is concerned precisely comparable and combinable figures are obtainable from the returns, in respect of almost every enquiry of general interest or importance, on the maximum scale of elaboration which is common to both countries; but there are bound to be formal differences and a different scale of elaboration owing to the peculiar requirements of the two national administrative systems for whose service the statistics are primarily intended.

In spite of the difficulties of co-ordinating statistics relating to different subjects or areas (as illustrated above) some definite progress can be recorded. For example, the Committee representing the Home Office, Board of Trade, the Registrars General and the Ministry of Labour (which sat before the Consultative Committee had been set up) co-ordinated as far as possible the classifications of industries and occupations used by the several departments in connexion with the Censuses of Population and Production and for other departmental purposes. Those classifications are being revised through the same machinery. In such matters as classifications of causes of death a measure of co-ordination has also been achieved.

#### EMPIRE STATISTICS.

The Imperial Economic Conference of 1923, recognising the importance of rendering the trade statistics published by the Government of the United Kingdom as valuable as possible with reference to the development of inter-imperial trade, recommended [Resolution 4 (B)] that the United Kingdom Board of Trade, after reviewing the statistics in question from this point of view, should draw up a detailed scheme and submit it to the Governments of the several parts of the Empire for their consideration.

The Imperial Conference of 1926 further considered this matter. The suggestion was made to it that an effective method of approaching the end in view would be gradually to modify and expand future issues of the existing Abstract for the British Oversea Dominions and Protectorates prepared by His Majesty's Government in Great Britain, for which purpose the Board of Trade in London would keep in touch with the several Government Authorities concerned; and that after one or two further issues of the Abstract it might be found desirable to hold a meeting of statisticians from the various parts of the Empire to review the progress made and consider the lines of further advance. The Conference endorsed these suggestions and views, and steps are being taken to include in the Abstract more data relative to production in cases in which these are available, and also overseas trade information relating to the United Kingdom similar in character to that already given for the Dominions and Protectorates.

It may be mentioned that the Imperial Conference of 1926 adopted resolutions recommending that steps should be taken to secure the co-operation of foreign countries (1) in connection with the publication of more complete, more uniform and more prompt statistics regarding the production, stocks, and consumption of wool throughout the world, and (2) in securing the compilation and prompt publication of international statistics relating to foodstuffs in cold storage. Action is being taken with a view to securing the co-operation of the Governments of the foreign countries principally concerned.

## INTERNATIONAL STATISTICAL INFORMATION.

The information furnished by the departments under this head is as follows :—

**Board of Trade.**

The main results of international statistical activity so far as the Board of Trade are concerned are :—

- (1) The continued suspension by the Board of the Statistical Abstract for Foreign Countries in view of the publication of statistics by the League of Nations (*see* page 276)
- (2) The bringing into effective operation of the Convention respecting the compilation of statistics of international trade.

This Convention, signed in 1913, had for object the establishment of an International Bureau of Commercial Statistics at Brussels, which was to collect, co-ordinate and publish statistical data respecting imports and exports. These data were to be supplied by the contracting countries in accordance with a common classification. The war interfered with the creation of the Bureau, but steps have been taken to proceed with the scheme and statistics for 19 countries were included in the last publication of the Bureau (relating to the year 1924). Particulars for the United Kingdom are included for the first time in the Bureau's latest annual " Bulletin."

The Mines Department has recently assisted in an international investigation of the wages and hours of coal miners which was undertaken by the International Labour Office.

**Ministry of Labour.**

(a) The statistics produced by this Ministry have already been, and will continue to be, influenced by the exchanges of views and the decisions of the three International Conferences of Labour Statisticians convened by the International Labour Office in October, 1923, April, 1925, and October, 1926. In the main these Conferences recommended methods of collection, treatment and publication similar to those already in use in this country, but where methods different from the British method were recommended, changes are being and will be made in British methods to bring them into line with the agreed international standard whenever that can be done without impairing the domestic utility of British labour statistics.

(b) The International Labour Office has done much to make easy of access, so far as possible in a comparable form, the principal labour statistics of the leading industrial countries. Its publications provide valuable surveys of international labour statistics which were not formerly available, and its periodical issues of overseas labour information enable developments in regard to labour matters abroad to be conveniently followed. In addition, the recommendations of the three International Statistical Conferences, referred to

above, appear to have had valuable results in stimulating other countries to improve and extend the collection and publication of social statistics.

#### **Ministry of Transport.**

The deliberations of the International Railway Union have led to a further effort to collate international railway statistics. The figures for the purpose are furnished to the Union by the railway companies direct. It may be pointed out, however, that the additional statistics now compiled by British railways for the returns required by the Ministry of Transport have materially increased the information which can readily be given, and the fact that they are prepared on uniform bases by all companies in Great Britain has rendered them the more valuable for the purposes of the Union.

#### **The Registrars General.**

The Registrars General adopted in 1910 the International List of Causes of Death as the basis of their tabulations, and thus took steps to secure international comparability of their Death Statistics.

The department of the Registrar General for England and Wales has been in touch with the International Labour Office regarding the establishment of an improved industrial classification for international purposes, and with the Health Section of the League with regard to certain matters governing the quality and reliability of the material utilised for international mortality statistics.

Some international statistics are contained in the Registrar General's statistical review and in the weekly and quarterly returns, while in previous Census reports some comparative international Census figures have also been included. Prior to the establishment of the League of Nations the department was disposed to extend this feature of its publications, but the appearance of statistical periodicals published by the League and the expectation that these would be further developed has resulted in the curtailment of such publications on the part of the department as no longer necessary.

**Appendix.****INDEX NUMBER OF INDUSTRIAL PRODUCTION.**

*Memorandum submitted by the Committee on Industry and Trade to the President of the Board of Trade with a covering letter dated 21st July, 1926.*

*Covering Letter.*

Dear President,

My Committee were recently informed that it would be useful to you if they were able to put before you their views as to the proposal that an index number of industrial production should be constructed and published at frequent intervals. I forward herewith a memorandum on the subject which has been unanimously approved by my Committee. The Committee, in adopting the memorandum, wished me to express to the Board of Trade their view that it is highly desirable that the proposed indices of production, when officially published, should be accompanied by the latest available figures of employment, prices, cost of living, foreign trade, and other similar data bearing on the movements of trade and industry.

In forwarding the memorandum to you, on behalf of my Committee, I venture to express the hope that it may be of assistance to the Board of Trade in reaching a decision as to the policy to be followed.

Yours faithfully,

(Signed) ARTHUR BALFOUR.

*Memorandum.*

1. The Committee on Industry and Trade have been informed by the Board of Trade that they have at present under consideration the question of compiling and publishing at regular intervals an index number showing fluctuations in the general level of industrial production in Great Britain. The Committee further understand that the President of the Board of Trade is desirous of obtaining an early expression of their views as to the expediency of such a step, together with any observations which they may wish to offer on the subject.

2. The Committee have been supplied with a memorandum on the subject by the Statistical Department of the Board of Trade, and they have also had the advantage of discussing it with officers of that Department. As regards the international aspect of the question, they have also been furnished with information as to the proceedings and recommendations of two important Committees by which it has recently been studied, i.e. the joint Committee on Economic Crises, representing the Economic and Financial Committees of the League of Nations, and the International Labour Office, and the "Comité d'Etudes," representing the International Statistical Institute and the Economic Committee of the League.

Lastly, they have examined the evidence given before them by commercial and industrial representatives so far as it bears upon the question now referred to them.

3. On broad grounds of national interest, the Committee have no hesitation in expressing their approval in principle of the proposal that the detailed surveys of industrial production, which are made at intervals of not less than five years, under the powers conferred by the Census of Production Act, should, so far as practicable, be linked together by the compilation and publication at much more frequent intervals of a series of intermediate estimates of the level of industrial production. It is probably not practicable to take a complete census of production at less than quinquennial intervals, but the value of these quinquennial surveys would be immensely increased if supplemented by a continuous series of intermediate estimates. The position would, in some respects, be analogous to the annual estimates of the Registrar General as regards population for years intermediate between successive census years, though, for many reasons, the Committee consider that the indices of production should be published more frequently than annually.

4. We consider that such indices, if carefully and scientifically compiled, would be of value not only to economists and statesmen, but also to practical business men, as throwing new light on current movements and tendencies of industry and commerce. At present the only published official data on which a business man has to rely are those relating to price levels, imports and exports, and the state of employment. These figures, though of great value in themselves, are insufficient, apart from an index of production, to give a true picture of the industrial position and prospects as a whole. Probably the unemployment figure is the best single index of industrial tendencies which is at present available, but a series of estimates of production, based solely on records of unemployment, would be seriously defective if extended beyond a comparatively short period, inasmuch as they fail to give any weight to changes in productive power based on improved methods and efficiency.

5. We are further impressed by the importance of the international aspect of this question. For several years past the attention of economic observers throughout the world has been directed to those cyclical movements of productive enterprise which are largely responsible for excessive fluctuations of employment. We do not in this memorandum propose to enter into the question of the ultimate causes of these alternative waves of prosperity and depression by which the world's trade is affected, but we agree with the various authorities by whom the problem has been studied in the belief that the intensity and, consequently, the harmful effects of crises are materially increased by the lack of authoritative and unbiased data as to the true economic position, and by the natural tendency of human nature in such circumstances to be swayed by unfounded

or exaggerated hopes and fears. We further note that these authorities in seeking to devise the best form of "economic barometer" give the first place to improved statistics of production. We cannot but attach great weight to these opinions and recommendations.

6. While, however, both on national and international grounds, we are warmly in favour of the principle of the proposal which the President of the Board of Trade has submitted to us, there are certain matters of practical detail to which we think it our duty to refer.

Such evidence as we have received makes it clear that the great trades differ widely among themselves as to the value attached to them to improved statistics, and as to their readiness, or reluctance, to disclose the necessary data to enable such statistics to be compiled. To some extent these differences of point of view arise from real differences in the conditions of the trades, to some extent they may perhaps represent traditional prejudices. But to whatever cause they may be due they have to be taken into account. Assuming as we do that the proposed indices of production would be based on purely voluntary returns, and that there is no intention to propose compulsory legislation, it is plain that the response immediately to be expected from different trades, and trade associations, is likely to be very diverse. Some trades will not only be willing to supply data towards the compilation of a general index, but will probably desire that separate indices of production for important groups of trades should also be published. Other trades, while willing to assist in the compilation of the general index, may perhaps object to the publication of separate indices for their own trades. Possibly, some trades might even be found which would at the outset feel hesitation in giving active co-operation even in the preparation of the general index. The response, which will be made by particular trades, can of course only be definitely ascertained as the result of negotiations. But we think that the Board of Trade, if they undertake the work, must be prepared to find some reluctance to co-operate on the part of certain trades, which it may take a good deal of time and patience to overcome. In the meantime, either the index number of production must be incomplete, or the gaps must be filled by careful indirect estimates based on such data as are available in each case. This will not materially affect the value of a general index if the gaps filled by estimating are relatively small in comparison with the whole area covered.

7. It is therefore highly desirable that the Board should do all in their power to diminish and disarm opposition by offering every possible guarantee that data relating to particular businesses will in no case be separately published or disclosed. We think, moreover, that it should be made clear that separate trade index numbers will only be published in the case of those trades which approve of

such publication, and that in all other cases the data obtained will be exclusively used for the compilation of a general index of industrial production as a whole. We also think it might be prudent to make it clear that the proposed index will only refer to production and not to stocks, materials or wages.

8. We do not desire to make any specific suggestion as to the frequency of the publication of the indices, as this must depend on the result of the negotiations which we recommend that the Board of Trade should open with representatives of the various trades, and also to some extent on the funds available. There are many reasons in favour of monthly publication ; but failing this, quarterly figures would be of considerable value. But we should like to emphasise the point, that, whatever be the period selected, every effort should be made to publish the figures as soon as possible after the close of that period in order that those concerned may derive the greatest practical advantage from the information. We also recommend strongly that the Board of Trade should endeavour, wherever practicable, to enlist the active co-operation of representative trade associations in obtaining from their members the necessary data, thereby lightening and expediting the task of final compilation.

9. We have not thought it necessary to go in detail into the question of cost, but we have satisfied ourselves, from our interviews with officers of the Board of Trade, that it is not likely to be great, and that it would be fully justified by the importance of the result. If, indeed, the proposed scheme should prove fully successful, it is quite possible that it may eventually be found practicable to lengthen somewhat the intervals between successive Census inquiries, in which case the cost of the index may in the long run be fully met by savings in the Census inquiries. Needless to say, until the permanent success of the method now proposed is demonstrated, it would be in the highest degree undesirable to take any action in the above direction. It is, however, to be hoped that by the time when the next Census year arrives (which we presume will be 1929, or thereabouts), sufficient information will have been obtained as to the practicability and value of the production index, to enable a decision to be taken as to the future.

10. In reply to the request of the President of the Board of Trade for their views, the Committee accordingly submit the following conclusions, which are based on the assumption that the data for the purpose of the proposed indices will be compiled on a voluntary, and not on a compulsory basis, and that the indices will relate to production only :—

- (a) That it is very desirable that percentage figures should be published periodically at suitable intervals by the Board of Trade as indices of the movement of industrial production generally.

- (b) That it is also desirable that separate indices of production should so far as practicable be compiled and published with regard to any important groups of industries which raise no objection to such publication.
- (c) That in order to allay any possible anxiety, the Board of Trade should give a public assurance that the confidential nature of returns relating to individual undertakings will be as fully respected as if they had been called for under the compulsory powers conferred by the Census of Production Act.
- (d) That, in order to be of as much value as possible to the business community, the figures should be published at the earliest possible date after the end of the period to which they relate.
- (e) That an endeavour should be made to induce the trade associations to collect as many as possible of the necessary particulars voluntarily from their members. The final figures should, of course, be calculated and published by the Board of Trade.



## CHAPTER VIII.

### PUBLIC TRADING ENTERPRISE.

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## PUBLIC TRADING ENTERPRISE.

## MUNICIPAL TRADING.

## Introductory.

The trading services engaged in by municipalities are now conducted, in bulk, upon a considerable scale and include numerous activities. The principal trading services are gas supply, electricity supply, water supply, and the construction and operation of tramways, light railways and, to a much smaller extent, omnibuses. Other activities classed as trading in the Annual Local Taxation Returns for England and Wales are the construction of houses and the administration of house property, the running of ferries, and the ownership and control of cemeteries, harbours, docks, piers, canals, and baths. Examples of all of the foregoing are common, but among the more exceptional trading activities of municipalities are a bank (Birmingham), a conditioning house (Bradford),\* a telephone system (Hull), cold storage accommodation (Wolverhampton), and dairies (Worcester). These do not exhaust the list of municipal activities, but the instances given are sufficient to indicate the multifarious nature of the trading services in which municipalities have engaged.

The degree of success with which the trading activities have met has, of course, varied from place to place, and from service to service, and is not wholly amenable to statistical or purely financial measurement. Many municipalities take a wide view of their responsibilities, and have embarked on activities of a trading or semi-trading character with a social aim—the supply to the citizens of services which they need, rather than with the ordinary commercial aim of showing a profit. In this their freedom of action is limited. There are departments into which they cannot enter without express parliamentary sanction, and others which they are compelled to enter, although on purely commercial grounds they are unlikely to be profitable. For instance, municipal housing schemes involving slum clearance cannot be compared in terms of cost with ordinary building enterprise. A complete survey of the area and results of municipal trading would require exhaustive special enquiries. Data,

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\* All textile fibres contain a certain amount of moisture and international standards of moisture content have been in force for many years. In order that purchasers may be safeguarded, it is a common practice to send textile goods to a conditioning (or testing) house controlled by an impartial authority, e.g. the Chamber of Commerce at Manchester and, as stated in the text, the Municipality at Bradford. The conditioning house tests samples and issues certificates as to moisture content, etc.

however, exist, especially in regard to gas, electricity and water supply and tramway services, for estimating the extent to which municipal enterprise has developed and for comparing this development with that of private enterprises engaged in the same services. It is the object of this chapter to examine the information available. In doing so, attention will be directed to the four principal services concerned, i.e. gas, electricity, and water supply, and tramway undertakings.

### Gas Undertakings.

#### *Historical.*

*The era of private enterprise.* The use of gas as an illuminant—the sole purpose in the early history of the gas industry—began in 1807, when Pall Mall was lighted by it. The Chartered Gas Light and Coke Company was formed by statute in 1810, and thereafter the use of the new illuminant advanced steadily throughout the country. For half a century the production and distribution of gas was regarded almost solely as a matter for private enterprise, and there was no idea that any supply undertaking should have a territorial monopoly. For a long period the only exception to private enterprise was at Manchester, where in 1817 the Commissioners of Police, the authority charged with the lighting of the streets, established a gas works. Their power to do so was regarded as implied in their street lighting powers, but later their right to supply gas to private consumers was challenged and they consequently obtained a special Act of Parliament in 1834. Manchester was incorporated in 1838, and the undertaking was then transferred to the Corporation.

The prevalent idea that competition in the supply of gas was both desirable and practicable may be illustrated by the early experiences of Birmingham and Glasgow. In Birmingham one company was incorporated by Act of Parliament in 1819 and another in 1825. In Glasgow, as the original company incorporated in 1817 did not give satisfaction a second one was established, also by statute in 1843, and as dissatisfaction still continued a third competing company was suggested in 1859 as a remedy. The Corporation then intervened, and after its offers to acquire the two undertakings had been rejected proposed itself to set up a competitive works. But by this time opinion was changing, and Parliament refused to sanction a third competitor, whether private or municipal, and urged existing companies to sell to the Corporation, a course adopted in 1869.

This movement away from competition exemplified in Glasgow is still more strikingly illustrated in two other cases where municipal ownership did not follow, i.e. in Sheffield and in London. The first gas company in Sheffield was formed in 1818. Opposition to what were regarded as monopolistic charges led to the formation of a new

company which began distribution in 1837. Seven years later the two rivals amalgamated as the Sheffield United Gas Light Company ; but in 1850 an opposition enterprise appeared in the form of a company formed under the Joint Stock Acts. The older undertaking claimed that its competitor, being non-statutory, had no right to lay mains in the public streets. The new company thereupon sought statutory powers ; when the measure came before a House of Commons Committee the desirability of amalgamation was urged upon the rivals, the Committee laying down that there should be only one company in Sheffield subject to provisions safeguarding the public ; and the amalgamation was made in 1855 under Statute. In London there were already two companies competing in the supply of gas south of the Thames when the South Metropolitan Gas Company was formed in 1833 (it was not incorporated until 1842) ; in some areas all three companies laid mains in the same streets and there was a price-cutting struggle to obtain customers, whilst prices were kept up in areas where competition had not developed. Clearly such conditions could not be permanent, and in the early fifties the competitors—then four in number—decided to divide up the area south of the Thames between themselves into non-competitive districts, and in order to make the arrangements secure sought to obtain parliamentary sanction to it. There was strong opposition, largely because of fears of monopolistic prices, aroused by ill-advised action on the part of the companies, and the Bill was defeated. But as the old conditions threatened to reassert themselves and were developing throughout the metropolis generally, the whole subject was referred to a special Parliamentary Committee, which reported in 1859 that competition was inadvisable, that there should be an allocation of areas, and that companies should be subject to certain conditions as to prices and profits and as to the illuminating power of the gas supplied by them. The necessary legislation was enacted in 1860.

*The municipalisation movement.* Throughout the first half century of its history the manufacture and supply of gas was generally regarded as a somewhat speculative undertaking, properly left to private enterprise, and, moreover, during the earlier part of that period the constitution and organisation of the English municipalities was not such as to fit them for the conduct of public utility undertakings, even had they desired to engage in it. But the new spirit which began to animate the municipalities after the reforms wrought by the Municipal Corporations Act of 1835 led the authorities to seek to extend their activities, and as the supply of gas passed into the stage of being a quasi-monopolistic service, attended with small financial risk and often yielding a substantial profit, the idea of municipal ownership began to develop. The only case of a municipality initiating a gas undertaking is that of Manchester already mentioned ; but municipal acquisition of existing undertakings became increasingly frequent.

In the period 1844 to 1867 there were 13 cases of gas undertakings acquired by municipal corporations; in the decade 1869 to 1878 there were 68, 29 of which were in the two years 1877 and 1878. Then the movement sustained a severe check, largely, it appears, because of the fears as to the future profits of the gas industry in face of the competition of electric lighting (there was a general decline in the value of gas company shares). From 1879 to 1892 there were only 17 cases of municipal acquisition, but by the latter year the fears of the effect of the new illuminant had diminished, and in the period 1893 to 1903 there were 67 instances. In the years 1904 to 1913 inclusive there were only 8 cases. These data relate to statutory undertakings only; there have been a number of transfers of non-statutory undertakings both to local authorities and to companies. There have been a few cases of acquisition by joint boards of two or more municipalities, and in one instance (Lanark) a county council has acquired several undertakings with a view to their amalgamation. Only in a very small number of instances (four) have municipal undertakings reverted to private ownership. There has been a continuing tendency to regard gas supply as a proper field for municipal ownership, including under that term ownership by urban district authorities and in a relatively small number of cases by rural district authorities. It should be added in this connexion that the general practice of Parliament has been to refuse to sanction the compulsory purchase of statutory undertakings and to approve only agreed schemes, there have, however, been some exceptions from this rule.

This movement towards acquisition by the municipal authorities was inspired by a variety of motives. An important one, illustrated by the action of the Glasgow Corporation described above, was the desire to protect the consumer against exploitation by what had come to be regarded as inevitably monopolistic undertakings, and to secure the maintenance of an adequate service. The force of this consideration has been, however, materially weakened by the development of control legislation, beginning with the Gasworks' Clauses Act of 1847, which generalised maximum price and maximum dividend provisions. In 1875 the Commercial Gas Company's Act inaugurated the "sliding scale" system referred to later in this memorandum,\* by which the dividend is reduced if the price is raised and vice versa, and rather more than half the statutory companies now work under this system.† Municipal undertakings in England and Wales are generally subject to a maximum price rule,\* as are rather less than half the statutory company undertakings. In Scotland, however, most of the local authority under-

\* See p. 314.

† In number the statutory companies which work under the "sliding scale" system represent rather more than half the total number of statutory companies. Those working under the system, however, were responsible for 68 per cent of the total output of statutory companies in 1926.

takings are required to fix a price at a level necessary to defray the estimated expenditure. There has been much legislation also, culminating in the Gas Regulation Act, 1920, as to the conditions of supply. These legislative developments, together with the rise of competition of other forms of lighting and heating, have greatly moderated the force of the particular argument for municipalisation stated at the beginning of this paragraph.

Another consideration, at least in the past, has been the desire to obtain revenue for the relief of local taxation. This was the express motive of the municipal acquisition of the Birmingham gas undertaking in 1874. There has been from time to time considerable controversy as to the merits of the policy thus enunciated, which regards municipal gas undertakings and similar public utility services as primarily profit-making concerns owned by the ratepayers, who are entitled to use the profits for any purpose they may think proper. The opposing policy is that which regards such undertakings as services to be administered in the best interests of the community as a whole, profit making being a subsidiary consideration to that of giving the best possible service at the lowest cost compatible with the avoidance of financial loss and thereby securing the largest possible utilisation of the service by the public. The trend of recent legislation has been towards the assertion of the latter principle. This will be seen from the following figures as to the years 1913 and 1925:—

		Number of Municipal Under- takings.	Number making a Net Profit	Aggregate Profit of Under- takings making a Profit.	Number con- tributing to Relief of Rates.	Aggregate Con- tributions in Relief of Rates (approx.)
				£		£
1913 ..	..	295	200	682,679	106	465,500
1925 ..	..	317	191	537,521	36	134,500

It will be seen from this table that the number contributing to the relief of rates, was 36 per cent. of the whole in 1913 and 11 per cent in 1925. The aggregate contributions in relief of rates fell by 71 per cent.

		Number of Municipal Under- takings.	Number incurring a net Deficiency.	Aggregate Deficiency of Under- takings incurring a loss.	
				£	
1913 ..	..	295	94	162,452	
1925 ..	..	317	126	290,669	

It will be seen from this table that the number incurring a deficiency was 32 per cent. of the whole in 1913 and 40 per cent. in 1925. The aggregate deficiency increased by 79 per cent. A comparison of the last column of this table with the last column of that immediately preceding shows that in 1913 the aggregate contributions to rates were approximately £303,000 greater than the aggregate deficiencies, but that in 1925 the aggregate contributions to rates were about £156,000 less than the aggregate deficiencies.\*

Other considerations which have influenced local authorities in undertaking the supply of gas have been administrative convenience in respect of the upkeep and repair of roads, e.g., the desire to avoid the inconvenience caused by the unco-ordinated action of a variety of undertakings having statutory rights to open up streets ; a certain amount of inter-municipal rivalry ; and, in some cases, the abstract belief that all public utility services should be in public ownership.

*Development of the industry.* Reference has been made above to the expectations widely held at one time as to the adverse effect of the development of electric lighting and heating upon the gas industry. Time has shown those expectations to be groundless. The following statement shows the sales of gas and the numbers of consumers in certain years since 1883 :—

							Gas sold.		Number of Customers.
							Thousand Million c.f.		
1883	..	..	.	..	.	..	68.3		1,979,481
1893	..	..	.	..	.	..	99.2		2,400,254
1903	..	..	..	..	.	..	147.7		4,230,721
1913	..	..	..	..	.	..	201.6		6,917,747
1923	..	..	..	..	.	..	241.6		7,810,350
1926	..	..	..	..	.	..	276.6		8,404,561

This continued advance in consumption has been due to three main causes (apart from the normal growth of population), namely :—  
(1) The utilisation of gas for heating purposes ; (2) the increasing facilities afforded by the gas undertakings, both "municipal" and "other," to consumers by the supply of heating and cooking apparatus on easy terms, and the introduction of the prepayment meter ; and (3) continuous improvements in methods of using gas for illuminating purposes.

\* See also table on p 313 as to net profits or deficits of local authorities undertakings.

It was remarked at the beginning of this memorandum that in the early stages of the industry gas was thought of only as an illuminant. But at the present time its predominant use is for heating purposes, for, according to the best available trade estimate of the total sales at the present time, 65 per cent. is for cooking and heating, 23 per cent. is for industrial purposes (chiefly heating), and only 12 per cent. is for lighting. No comprehensive data for the whole country as to the use by consumers of gas appliances for heating are available, but for one great gas company the number of gas appliances (sold or on hire), including cooking and heating stoves and water heaters, known to be in use in the company's area rose from 417,663 in 1903 to 1,539,409 in 1922. This, it is believed, is indicative of a general trend. There is no doubt that since 1922 there has been a further rapid increase in the numbers of appliances in use ; their adoption has been greatly stimulated by the difficulties experienced from time to time by domestic consumers in obtaining supplies of coal owing to disputes in the coal mining industry.

*Extent of municipal and private enterprise.*

As a result of the history outlined in the foregoing paragraphs, the industry is now divided between municipal and company owned undertakings. In 1925 there were in Great Britain 782 "statutory" gas undertakings (i.e. undertakings operated under legislative authority giving them, *inter alia*, the right to open up roads) ; of these 317 were "municipal" and 465 were "other." The number of consumers supplied by municipal undertakings was 3,252,000, and by "other" undertakings 4,949,000 ; the sales of gas were 96,000 million cubic feet and 170,000 million cubic feet, respectively. The "municipal" undertakings thus had 36 per cent. of the total sales. The general position in this respect is materially affected by that in the London area, where six non-municipal undertakings had in 1925 sales amounting to some 70,000 million cubic feet. Thus, outside the London area the sales were divided almost equally between "municipal" and "other" undertakings. The attitude of the larger municipal authorities in England and Wales is by no means uniform. Thus, the gas supply is municipally owned in Birmingham, Bradford, Coventry, Halifax, Huddersfield, Leeds, Leicester, Manchester, Nottingham, Oldham, Rochdale, Salford ; it is in the hands of companies in London, Bournemouth, Brighton, Bristol, Cardiff, Croydon, Derby, Liverpool, Newcastle, Norwich, Portsmouth, Sheffield, Southampton, and Swansea. In Scotland, on the other hand, all the large municipalities own the gas supply ; in fact out of 76 statutory undertakings in Scotland only four are carried on by companies.

Detailed information as to the working of all statutory gas undertakings in Great Britain is published in Annual Returns issued by the Board of Trade. The following figures have been calculated

from these returns with a view to indicating the share of the industry held by municipal and private enterprises respectively in 1913 and in 1925, and the increase which has occurred in regard to the various factors in the case of each type of undertaking during the period.

Percentage of total in the hands of municipal undertakings.

	1913.	1925.
	<i>Per cent.</i>	<i>Per cent.</i>
Number of consumers supplied ..	40	40
Length of gas mains owned ..	39	41
Sales of gas .. .. ..	36	36

Percentage increase 1913 to 1925.

	<i>By Municipal Under- takings.</i>	<i>By Other Under- takings.</i>
	<i>Per cent.</i>	<i>Per cent.</i>
Number of consumers supplied ..	16.5	20
Length of gas mains owned ..	19.5	12
Sales of gas .. .. ..	31	32

These figures indicate that the share of the industry in the hands of municipal undertakings was about the same, i.e. rather less than 40 per cent. in 1925 as in 1913.

There is available another set of data as a result of the Censuses of Production of 1907 and 1924, from which the following figures are taken. It must be remembered that the Census of Production returns cover all gas undertakings, including, therefore, between 600 and 700 "non-statutory" undertakings (practically all of which are relatively small) carried on by companies.

Percentage of total in hands of municipal undertakings.

	1907.	1924
Output of gas .. .. ..	34	32
*Net output (all products) .. .. ..	33	33
Numbers employed .. .. ..	34	30

Percentage increase 1924 over 1907.

	<i>Municipal Under- takings.</i>	<i>Other Under- takings.</i>
Output of gas .. .. ..	95	111
*Net output (all products) .. .. ..	78	75
Numbers employed .. .. ..	19	42

\* The "net output" is the total value of all output, gas and other products, less the cost of the materials used.

These figures also go to show that the share of the industry in the hands of municipal undertakings has remained about constant ; but they show a rather smaller proportion, i.e. about 33 per cent., as the share of the municipal undertakings in the industry as a whole than that shown by the Annual Returns. The reason, of course, lies in the fact that the Census of Production includes the non-statutory companies.

The respective shares of the municipal and other undertakings as shown both by the Annual Return and the Censuses of Production having remained more or less unchanged, it might be expected that the increase in the number of consumers, sales, output, etc., would not differ widely as between the two kinds of undertakings. This, in fact, is the case, the only wide divergence shown in the figures given above being in the numbers employed, which increased by 19 per cent. in the case of the municipal undertakings as against 42 per cent. in the case of the other undertakings\*.

*Prices and profits.*

It is impossible to obtain satisfactory comparable figures with regard to the prices charged for gas by municipal and company owned undertakings.

As to profits, the following figures of revenue receipts, revenue expenditure and gross profit compiled from the Annual Returns issued by the Board of Trade, are intended to give an indication of the revenue cost of producing 1,000 cubic feet of gas in the two periods :—

	Revenue Receipts per 1,000 cubic feet sold.	Revenue Expenditure per 1,000 cubic feet sold.	Gross Profit per 1,000 cubic feet sold.
1913 Municipal Undertakings ..	s. d. 3 2.5	s. d. 2 6.4	s. d. 0 8.1
1925 Municipal Undertakings ..	4 7.2	3 11	0 8.2
1913 Other Statutory Undertakings	3 6.7	2 10.1	0 8.7
1925 Other Statutory Undertakings	5 2.1	4 5.9	0 8.2

\* An accurate determination of the precise causes of this difference would involve a detailed technical examination of the history and conditions of the individual undertakings. An important reason, however, is that in 1907 many "shift-men" employed in municipal gasworks worked an eight-hour shift, while the gas companies' "shift-men" generally worked a twelve-hour shift. In 1924, both worked an eight-hour shift with a consequent increase in the number of "shift-men" in company undertakings. Further, in the smaller undertakings the change meant a greater increase than 50 per cent in the number of "shift-men" owing to the small number originally employed and the small company undertakings, especially if, as in this case, the non-statutory undertakings are included, are far more numerous than small

The table shows that, in both periods, the revenue receipts and the revenue expenditure of the municipal undertakings were slightly lower than those of the other undertakings. It also shows that the gross profit of the municipal undertakings remained practically the same, whereas that of the other undertakings fell by  $\frac{1}{2}d.$  per 1,000 cubic feet sold. In this connection, however, it is important to note that, upon the whole, the municipal undertakings are situated nearer to the coal-fields than are the company undertakings and that, consequently, the cost of coal tends to be lower in the case of the municipal undertakings as a whole.

It is impossible to compare the net profits of the two types of undertaking, as the amount paid by companies as interest on capital is not available. Moreover, any comparison of the financial results of the two types of undertaking is materially affected by the differences in regard to the raising and repayment of capital to which reference is made in the following section.

As to the municipal undertakings, however, the following Table shows the net profit or deficit (after meeting revenue expenses, interest on loans, repayment of loans, and payments to Sinking Funds) of all Local Authorities' undertakings for the years 1910-14 and 1920-26:—

Year.	Net Profit or Deficit				
	£				
*1910-11	..	..	..	..	964,292
*1911-12	..	..	..	..	1,031,300
*1912-13	..	..	..	..	1,130,929
*1913-14	..	..	..	..	549,844
1920-21	..	..	..	..	439,312
†1921-22	..	..	..	Deficit	1,102,815
1922-23	..	..	..	..	1,768,833
1923-24	..	..	..	..	1,629,565
1924-25	..	..	..	..	258,075
1925-26	..	..	..	..	246,852
†1926-27	..	..	..	Deficit	641,974

These figures, even if the two years in which coal strikes occurred be disregarded, illustrate the trend, noticed above, away from the policy of treating municipal gas undertakings primarily as profit making concerns owned by the ratepayers.

\* The figures include Ireland, in regard to which the net profits were in the region of £30,000 per annum.

† During each of these years a prolonged stoppage occurred in coal-mining.

*Conditions of working.*

*Maximum price and sliding scales.* Nearly all municipal undertakings are subject to a maximum price of gas, although in Scotland, where the gas supply is practically all in the hands of the local authorities, and in some cases in England and Wales, the local authorities have no maximum price rule but are required to fix the actual price of gas so as to raise, as nearly as can be estimated, sufficient income to discharge the expenses of the undertaking, any surplus or deficiency being carried forward to the following year. As to the company undertakings, about half the statutory companies are regulated by a maximum price and maximum rates of dividend. Nearly all the rest are subject to a sliding scale of dividend in respect of their ordinary capital. Under this system a standard price of gas and a standard rate of dividend are fixed for each undertaking, and the rate of dividend must fall as the price of gas rises and may rise as the price of gas is reduced.

*Raising of capital* Local authorities obtain power to borrow money for capital purposes in respect of their gas undertakings either by Act of Parliament or by Special Order made by the Board of Trade under the Gas Regulation Act, 1920, or, in Scotland, by Provisional Order under the Private Legislation Procedure (Scotland) Act, 1899. Sometimes power to borrow specific sums of money is granted but generally a Government Department is authorised to sanction specific loans for specific purposes. Companies owning statutory gas undertakings are limited as to the amount of capital they may raise, and from time to time they must apply to Parliament by Bill or to the Board of Trade for a Special Order to increase the amount of share capital or stock and loan capital which they may issue. It is the practice to require that such additional share capital or stock shall be issued by auction or tender, and to limit the rate of dividend which may be paid thereon.

*Repayment of capital, and depreciation funds.* In the case of municipal undertakings depreciation is generally provided for by the requirement to repay within a definite period the loan out of which specific plant is purchased. A reserve fund, usually limited to one-fifth of the aggregate capital expenditure on the undertaking, is also allowed to be formed and may be used to meet any extraordinary claim on the undertaking or for renewing any part of the undertaking. It is not the practice for statutory gas companies to set apart sums for depreciation, and they are, in theory, required to maintain their undertakings out of the current year's revenue. Of late years, however, depreciation has been allowed in respect of movable plant such as meters and stoves. In the case of maximum price companies a reserve fund is allowed to be accumulated up to a maximum of one-tenth of the nominal capital of the company. This may be used for the equalisation of dividend or to meet any extraordinary claim or demand on the undertaking. In the case of sliding scale

companies, a special purposes fund may be formed out of revenue to cover certain definite contingencies, but must not exceed one-tenth of the paid-up capital of the company. A renewal fund operating over a period of about six years may be formed by sliding-scale companies, but no other reserve fund is allowed. With a view, however, to equalising their dividend in bad times the company may if they wish accumulate sums which they might otherwise have distributed as dividend. As regards works required for the expansion of the undertaking, a company is required to pay for these out of capital, but local authorities frequently meet the cost out of revenue.

*Public lighting.* A gas undertaking is required to supply public lamps within 50 yards of its main, the price to be settled, in default of agreement, by arbitration.

*Hire and sale of fittings.* Identical powers as to the purchase, sale and hire of gas fittings are given to local authorities and companies. Neither is allowed to manufacture, and the former are required to adjust their charges for fittings so as to cover their expenses, and are also required to keep separate accounts of their fittings business.

### Electricity Supply Undertakings.

#### *Historical.*

Electricity, like gas, was in its early stages principally supplied for purposes of lighting, its application for power purposes being almost unknown. With this exception its early history was noticeably different from that of gas supply. First, the electricity supply industry began about sixty years later than the gas industry, so that, unlike the gas industry in its earlier stages, electricity supply always had to compete with another large and well-established industry. Further, the gas industry, as has been stated above, was at first solely in the hands of private enterprise ; but, on the other hand, the most important piece of legislation in the earlier history of the generation and distribution of electricity by authorised undertakers, the Electric Lighting Act of 1882, was passed at a time when the movement towards the municipalisation of gas works had developed, and when there was a widespread belief that electricity was likely to supplant gas almost entirely. Consequently, great care was taken in drafting the Act to secure the safety of the public from exploitation by commercial monopolies. Two of the provisions made with this end in view are worth mention. If municipalities consented, the Board of Trade might grant companies seven-year licences, but if the municipalities refused their consent, concessions

to companies could only be made by an Order of the Board of Trade confirmed by Parliament. Still more important, the precedent of the Tramways Act of 1870\* was followed in providing that after 21 years (extended by the Act of 1888 to 42 years) the local authority might purchase a company undertaking compulsorily at the then value of the company's assets without any addition for compulsory purchase, goodwill, or future profits. Two main results followed from the restrictions to which companies were subjected. The encouragement given to municipalities to start electricity supply stations led to these being set up by numerous local authorities, many of whose areas were too small to justify an independent supply. On the other hand, the restrictions imposed in regard to commercial enterprises not only discouraged companies from engaging in electricity supply, but also, particularly as a consequence of their liability to compulsory purchase, prevented private enterprises from developing their full efficiency.

An amending Act was passed in 1888 providing for an extended tenure in the case of companies as indicated above; and in 1898 a Joint Select Committee of the two Houses of Parliament considered the question of the supply of electricity over wide areas, with the result that a number of Power Companies were subsequently authorised by private Acts to supply electricity in bulk and for power purposes over large areas, subject to certain restrictions, the undertakings of such companies, however, being exempted from the purchase provisions of the Act of 1888. For the two main reasons given, i.e. the existence of the gas industry and the nature of the Electric Lighting Act, the development of the use of electricity was considerably slower in Great Britain than in various other important countries. In 1916 a Committee was appointed by the Board of Trade to consider the position of the electrical trades after the War, and it recommended, *inter alia*, the appointment of a special Committee to consider the question of electric power supply. This further Committee was set up and reported in 1918. In its report it drew attention to the faults in the then existing Acts, and stated that it had been conclusively proved that a municipal area was rarely the most economical area of electrical supply, and that the state of uncertainty consequent upon the purchase provisions had undoubtedly been adverse to the proper development of company undertakings. The Committee described the absence of standardisation which resulted as chaotic, quoting the example of Greater London, where 70 generating stations had 50 different types of system, 10 different frequencies and 24 different voltages. The Committee, therefore, recommended that the existing system under which electricity was separately generated for small areas should be abolished, and that a body of Electricity Commissioners should

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\* See p. 325.

be set up to regulate the supply of electricity and to encourage its generation and distribution. This was done under the Electricity (Supply) Act, 1919.

After some years' experience of the operation of the Act of 1919, the position of the electricity supply industry was reviewed by a further Committee and a modified basis for future development was laid down by the Electricity (Supply) Act, 1926. That Act provided for the setting up of an executive public body, namely, the Central Electricity Board, consisting of eight persons appointed by the Minister of Transport, to carry out schemes of technical development for the whole country prepared by the Electricity Commissioners, such schemes involving the concentration of generation in a limited number of selected stations to be operated under the control of the Central Board and the provision by the Central Board of main transmission systems for enabling authorised undertakers in general, whether municipalities or companies, to obtain their supplies of electricity in bulk either directly or indirectly from the Central Board. The Act leaves the distribution and commercial development of electricity in the hands of such undertakers as hitherto.

In 1925-26 there were 358 local authority undertakers, 233 companies, and 2 joint electricity authorities. As in the cases of local authorities' gas undertakings, some municipal electricity supply undertakings make contributions in relief of rates, while others have to call on the rates for contributions to the electricity supply undertaking. The figures are:—

	1921-22.		1925-26.	
	Number of Under-takings.	Amount	Number of Under-takings	Amount.
Contributions to Local Rates	40	£ 278,494	107	£ 760,267
Contributions from Local Rates	44	123,174	17	18,236

There is, however, a growing tendency on the part of many local authorities to apply surpluses to the reduction of charges and to purposes connected with strengthening the financial position of the undertakings rather than to the relief of the local rates, while one of the effects of the Electricity (Supply) Act, 1926, will be to curtail the amount of the surpluses which can be used for the latter purpose.

*Extent of municipal and private enterprise.*

Prior to the constitution of the Electricity Commission in 1920 no official statistics relating to the public supply of electricity were regularly compiled. Consequently, no comparison is possible between the operations of electricity supply undertakings in the pre-war period and in recent years, such as has been made above in regard to gas supply from the figures published in the Annual Returns by the Board of Trade. Since their constitution the Electricity Commissioners have established a complete system for collecting and collating statistics, and have published two volumes of statistics which, between them, cover the years 1920 to 1925. A further volume covering the year 1925-26 is in course of publication. The following figures have been abstracted from these volumes, or calculated from figures contained in them, with a view to indicating the share of the industry held by municipal and private enterprises, respectively. The figures relate, in respect of English local authorities to the years ending 31st March (with a few exceptions), in respect of Scottish local authorities to the years ending 15th May (with a few exceptions), and in respect of companies to the years ending 31st December.

## Local authorities' percentage of total.

	1920-21 (except where otherwise stated).	1925-26.
Aggregate capital expenditure .. .. ..	64 (1921-22)	64
Capacity of generating plant installed .. ..	67 (1922-23)	67
Coal and coke consumed .. .. ..	67	69
Oil consumed .. .. ..	34	26
Load connected .. .. ..	66	66
Units sold .. .. ..	63	64

## Percentage increases between 1920-21 and 1925-26.

	Local authorities.	Com- panies.
Aggregate expenditure* .. .. ..	51	51
Capacity of generating plant installed† .. ..	43	43
Coal and coke consumed .. .. ..	13	4
Oil consumed .. .. ..	100	193
Load connected .. .. ..	58	58
Units sold .. .. ..	62	56

\* The comparison is between 1921-22 and 1925-26.

† The comparison is between 1922-23 and 1925-26.

These figures indicate that the local authority undertakings represent about two-thirds of the whole, and that their growth and that of the companies has, proportionately, been very similar during the period 1920 to 1926.

Owing to the varying circumstances and conditions under which local authorities and companies operate, however, only broad conclusions, such as the statement just made, can be drawn. The local authority supply areas are mostly confined to the large and moderate-sized towns, but quite a considerable number have powers extending outside their own districts. The companies' supply areas include the important areas of the London group and also a few large areas supplied by company undertakings in the provinces, but otherwise the company undertakings are small. The Power Companies have wide areas of supply.

As has been stated above, no comparison with pre-war conditions can be made from the figures of the Electricity Commission, which was only constituted in 1920. For this purpose, however, some data are provided by the Censuses of Production of 1907 and 1924. The following figures are taken from that source.

Percentage of total in hand of local authorities.

		1907.	1924.
Electricity generated	.. .. .. ..	62	65
Selling value	.. .. .. ..	64	65
Net output*	.. .. .. ..	64	65
Numbers employed	.. .. .. ..	62	67

Percentage increase, 1907-24.

		Local authorities.	Companies.
Electricity generated	.. .. .. ..	366	314
Selling value	.. .. .. ..	331	321
Net output*	.. .. .. ..	301	291
Numbers employed	.. .. .. ..	129	86

\* Net output is the value of the electricity supplied less the cost of the materials used.

These figures confirm those of the Electricity Commission already given in showing that the share of the industry in the hands of the local authorities is about two-thirds of the whole. They also indicate that that share is slightly larger (i.e. by 1 or 2 per cent. of the total) than the pre-war share, there having been a somewhat greater increase in the activities of the local authorities than in those of the companies.

*Prices and profits.*

The average revenue per unit sold (excluding bulk supplies) was :—

	1921-22.		1925-26.		Reduction 1921-22 to 1925-26.	
	Local author- ties.	Com- panies.	Local author- ties.	Com- panies.	Local author- ties.	Com- panies.
Lighting and do- mestic.	Pence. 5.47	Pence. 6.39	Pence. 3.38	Pence. 4.95	Pence 2.09	Pence. 1.44
Public lighting ..	2.96	2.41	1.94	2.07	1.02	0.34
Traction .. ..	1.76	1.46	1.19	0.92	0.57	0.54
Power .. ..	1.80	1.52	1.01	0.97	0.79	0.55
Total ..	2.57	2.33	1.64	1.66	0.93	0.67

These figures show (a) that the figures for the total and for the various classes approximate closely both in 1921-22 and in 1925-26 as between the local authorities and the companies except for "lighting and domestic," in which case the average for the local authorities in both years was much lower than that for the companies, and (b) that there has been a greater reduction of average price in every class and in the total in the case of the local authorities than in the case of the companies.

The average working expenses (including inter-purchase of energy but excluding capital charges) per unit sold were :—

	1921-22.		1925-26.	
	Pence.	Pence.	Pence.	Pence
Local authorities ..	..	..	..	1.80 0.98
Companies ..	..	..	..	1.61 0.90

The average working expenses of the companies per unit sold, therefore, were slightly lower in each year than those of the local authorities.

The aggregate surplus (i.e. the balance of revenue from all sources over working expenses) was :—

	1921-22		1925-26	
	£	£	£	£
Local authorities ..	..	7,751,580	..	11,609,361
Companies ..	..	4,062,258	..	8,048,361

As to the appropriation of this aggregate surplus, the figures for 1925-26 may be taken as fairly typical and were :—

Local authorities :—		Per cent.
For interest charges .. .. .. ..	34.84	
For transfer to sinking fund and repayment of loans .. .. .. ..	38.77	
 Total for loan charges .. .. .. ..	 73.61	
For net transfers to reserve and renewals fund .. .. .. ..	8.08	
Applied to capital expenditure .. .. .. ..	11.00	
Net contributions to rates .. .. .. ..	6.39	
Net increases in balances on net revenue account .. .. .. ..	0.92	
 Companies :—		
For interest charges .. .. .. ..	16.53	
For preference dividends .. .. .. ..	10.18	
For ordinary dividends .. .. .. ..	27.02	
 Total for remuneration of capital .. .. .. ..	 53.73	
For transfer to depreciation and reserve funds .. .. .. ..	41.02	
For transfer to appropriation accounts common to combined undertakings (e.g. gas and electricity)	4.07	
Net increases in balances on net revenue account .. .. .. ..	1.18	

In connexion with these figures as to financial results and particularly the appropriation figures, the differences between the two groups of undertakings as to the raising and repayment of capital should be borne in mind. These are described in the following section.

#### *Conditions of working.*

*Maximum prices.*—The orders granted both to local authorities and companies prescribe maximum prices which are subject to revision by the Minister of Transport at triennial periods on the application of the undertakers, the local authority (when not the undertakers), or a certain number of consumers. The fixing of actual prices, however, subject to their being within the limits of the authorised maximum, is a matter within the discretion of the undertakers themselves. There is no difference between the two groups in these respects.

*Sliding scale.*—Local authorities are not, of course, under any sliding scale of price and dividend. The power companies are for the most part subject to such scales, but in no case has the scale

come into practical operation owing to the large sums payable by way of back dividends or for other reasons. The London group of companies have as from 1st January, 1926, been placed under sliding scales, but owing to the delay in fixing the standard prices the effect of such scales has not yet been experienced. There are one or two cases of distributing companies being subject to sliding scales, but, speaking generally, this familiar feature of gas legislation is absent in the case of such companies. It may be noted that sliding scales may be imposed by the Electricity Commissioners under the Electricity (Supply) Act, 1926, in cases where companies (not being power companies) receive a bulk supply directly or indirectly from the Central Electricity Board; and also under the Electricity (Supply) Act, 1922, when a company's tenure is extended.

*Raising of capital.*—The capital required by local authorities for electricity supply purposes is normally raised under the Electricity (Supply) Acts in the same manner as for their other capital purposes, i.e. by loans with the sanction of the appropriate Government Department (now the Electricity Commissioners). The capital expenditure of the companies is under no such control, and at the end of 1925 consisted as to 35.6 per cent. of loan capital, as to 24.8 per cent. of preference shares; and as to 39.6 per cent. of ordinary shares.

As the capital required by local authorities is raised on the security of the local rates, its cost for interest is less than the cost for interest and dividends of the companies' capital. At the present time local authorities obtain their loans at about 5 per cent. As to the companies, the average interest or dividend paid during 1925 was:—Loans, approximately 5.25 per cent., preference shares 5.69 per cent., and ordinary shares 9.41 per cent.

*Repayment of capital*—The local authorities carry on their operations by means of borrowed capital, and provision has to be made by them for the repayment of all loans within certain prescribed periods according to the probable life of each class of asset (land, buildings, plant, mains, etc.). This provision is more than the equivalent of commercial depreciation, and in so far as it exceeds the latter, it represents the gradual acquisition by the local authority of the unencumbered ownership of the assets. As regards wasting assets (plant, machinery, mains, meters, etc.) the sinking fund of a local authority is the equivalent of the depreciation fund of a company, the replacement of the asset being the object of both. Thus, the obligation resting on a local authority to repay its capital may ultimately result in the partial acquisition of its undertaking unencumbered with debt, if it provides for the replacement of its wasting assets out of revenue or otherwise than by fresh borrowings. In the majority of cases, however, such a result is only partially being brought about, as the local authorities content themselves with

providing the annual instalment in repayment of debt, leaving replacements to be provided by fresh borrowings when the original loans have been discharged.

*Depreciation funds, etc.*—Section 7 of the Schedule to the Electric Lighting (Clauses) Act, 1899, which governs the application of revenue of nearly all the electricity undertakings of local authorities, does not contemplate or allow for the provision of any depreciation fund for the reasons indicated above. But the section gives power to establish a reserve fund up to one-tenth of the aggregate capital expenditure on the undertaking. Most of the local authorities of any standing possess reserves in some form or other. Many of them defray certain items of capital expenditure out of revenue, and in this way create a hidden reserve. The aggregate sums so applied out of revenue and other sources at the end of 1925-26 reached the total of £9,006 050. In this way funds may be provided for the expansion of the undertakings without recourse to borrowing. In cases where special powers have not been obtained by local Acts, it is now open to local authorities under the Electricity (Supply) Act, 1926, with the consent of the Electricity Commissioners, to apply surplus electricity revenue in payment of expenses chargeable to capital.

*Charge for public lighting.*—Where the local authorities are not themselves the undertakers the charge for public lighting is determined, in default of agreement, by arbitration (Electric Lighting (Clauses) Act, 1899); in the case of local authority undertakings it is a matter of arrangement between the Electricity and Streets Committees of the local authority. Where what is known as the Northumberland Clause applies the local authority is required not to charge for street lighting a higher rate than that charged to consumers using current for lighting for the like hours of supply.

The average charges in 1925-26 for public lighting compare thus:—

Local authorities .. .. ..	1.94d. per unit.
Companies .. .. ..	2.07d. ,,

*Hire and sale of fittings.*—Prior to the passing of the Electricity (Supply) Act, 1926, local authorities generally only had power to let out fittings on hire; a substantial number of authorities possessed powers to sell and such powers have been made general by Section 48 of that Act subject to certain conditions. The capital expended for apparatus let on hire up to the end of 1925-26 was as under:—

Local authorities .. .. ..	£844,596	or 78 per cent.
Companies .. .. ..	£232,761	or 22 per cent.
Total .. .. ..	£1,077,357	or 100 per cent.

Hitherto the local authorities have done more in this direction than the companies, and the new powers will probably stimulate their endeavours.

### Water Undertakings.

Under the English Common Law every landowner can use water flowing in defined channels through or past his land, but may not abstract such water for sale. The owner has, however, the exclusive right to underground water and water not flowing in defined channels. In early times powers to construct waterworks were granted by means of charters or by Royal Warrants ; but the chief form of authority for water undertakings has been by private Acts of Parliament, the first of which appears to be one dated 1541 conferring powers upon the municipality of Gloucester. The London Bridge Waterworks were established by a Dutchman, Peter Morrys, in 1581, and Sir Hugh Myddleton's New River Company, empowered by charter, started operations in 1613. Thus, from its inception piped water supply has been in the hands partly of municipalities and partly of companies.

Numerous enquiries have been held into the question of water supply, most of them being primarily directed towards the question of purity. Among the results were a number of Acts passed in the mid-nineteenth century, which gave general powers, under certain conditions, to local authorities to provide their districts with water, and which enabled companies to obtain powers by provisional order procedure. In spite of this general legislation the practice of obtaining special Acts has continued. The municipalities have no general powers of compulsory purchase of undertakings belonging to companies, and the practice of Parliament as to giving such powers when sought in individual cases by special Bill has varied with the circumstances of the cases themselves. In numerous cases, however, Acts authorising the purchase of company undertakings by municipalities have been passed and the company owned services superseded by municipal services. Two important examples of this are London, where the eight company undertakings then in existence were transferred to the Metropolitan Water Board, a joint body composed of representatives of the municipalities concerned and of the Thames and Lee Conservancy Boards, in 1903, and Liverpool, where the powers of the two public companies were transferred to the Liverpool Corporation.

The present position is that water is supplied by five different types of undertakings : (1) Municipalities, (2) joint boards or committees of two or more municipalities, (3) statutory companies, (4) non-statutory companies, (5) private proprietors. The non-statutory companies are all of minor importance, and the under-

takings of private proprietors are very small and as a rule supply only the property of the proprietors. Important municipal undertakings are those of Birmingham, Bradford, Hull, Leeds, Liverpool, Manchester, and Sheffield, and among important undertakings operated by companies are those of the South Staffordshire Waterworks, Bristol, Newcastle, Portsmouth, and Sunderland.

As to the comparative extent of municipal and company enterprises respectively, the returns received in connexion with the Censuses of Production show that the net output (i.e. value of output less cost of materials used) of the municipalities formed 81 per cent. of the total in 1907 and in 1924, and the net output of the companies formed the remaining 19 per cent at each date.

### Tramways and Light Railways.

#### *Historical.*

Tramways were introduced into Great Britain in 1860 and were first constructed by private enterprises under powers conferred by private Acts of Parliament. The Tramways Act of 1870, however, provided in addition a procedure enabling promoters to obtain an authorising order from the Board of Trade, subject to confirmation by Parliament. Under this Act, which is still in force,\* promoters had to obtain the consent of the local authorities concerned, though the Board of Trade were given the right to make an Order where the consent of the local authorities concerned with not less than two-thirds of the length of the tramway had been obtained. The consent of the local authorities concerned is also necessary under the Standing Orders of the House of Commons where powers are sought by means of private Bills. Even more important, the Act gave a local authority the power to purchase compulsorily any tramway in its area, whether owned by a company or by another municipality, at the end of twenty-one years and at recurring periods, at the actual value, fixed by a referee, of the permanent plant without any payment in respect of profits or compensation for compulsory sale.† The Act gave municipalities the power to construct tramways but not the power to work them, and consequently local authorities could only work tramways when they had obtained a private Act of Parliament which specifically authorised them to do so. It was only gradually that Parliament began to allow

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\* The Minister of Transport now exercises the powers previously conferred on the Board of Trade.

† The effect of the application of this provision to electricity supply is referred to on p. 316.

municipalities powers to work tramways, but from 1896, the policy of refusing to grant powers was abandoned. The capital expenditure involved in the change to electric traction frequently made it impossible for a company to carry out the change, especially if it was nearing a date when there was a liability to compulsory purchase, and, consequently, the process of the acquisition of tramways by local authorities from companies was accelerated by the introduction of electricity.

Many miles of line of the nature of tramways, both on public streets and on land purchased for the purpose, have been constructed under the Light Railways Act, 1896, under which the local authorities also have a power of objection to privately promoted enterprises.

In 1925 there were 170 undertakings owned by local authorities and 71 owned by companies, of which 166 and 70 respectively were operated, the capital expenditure on the local authorities' tramways amounting at that date to, approximately, £77,000,000, and that on the companies' tramways to, approximately, £20,000,000.

As in the case of local authorities gas undertakings, some of the local authorities tramway undertakings have made profits and others have made losses, and have had to draw upon the local rates. Figures are not available for a comparison with a pre-war year, but the figures for the financial year 1925-26 show that 65 per cent. of the local authorities tramway undertakings, representing 54 per cent. of the capital expenditure on such undertakings, earned an income sufficient to meet every charge upon it and make payments to reserve; and that a further 4 per cent. of the undertakings, representing 14 per cent. of the capital expenditure earned sufficient to meet all charges and only showed a debit balance because of payments to reserves. At the other extreme, 6 per cent. of the undertakings, representing 3 per cent. of the capital expenditure, failed even to earn sufficient to cover their working expenses. The remaining 25 per cent. of the undertakings, representing 29 per cent. of the capital expenditure, were unable to meet some, or in a few cases, all the charges upon their income.

#### *Extent of municipal and private enterprise.*

Detailed information as to the working of tramways and light railways is published in Annual Returns, now issued by the Ministry of Transport. The following figures give some indication of the extent to which the industry was in the hands of municipal and private enterprises respectively in 1913 and 1925, and the increase which has occurred in regard to the various factors in the case of each type of undertaking during the period.

## Local authorities percentage of total.

		1913.	1925.
Aggregate capital expenditure	..	71	79
Route-miles open	..	63	73
Number of cars owned..	..	73	82
Car-miles run ..	..	75	83
Electricity consumed ..	..	81	85
Passengers carried ..	..	80	87

## Percentage changes, 1913-25.

	<i>Local Authorities.</i>	<i>Companies.</i>
Capital expenditure ..	Increase of 41 per cent.	Decrease of 11 per cent.
Route-miles open ..	19	24 ..
Number of cars owned..	25	25 ..
Car-miles run ..	26	22 ..
Electricity consumed ..	30	5 ..
Passengers carried ..	54	10 ..

The figures show that, in regard to each of the items mentioned, the local authorities were responsible for a higher proportion of the total in 1925 than they were in 1913. The proportion, however, varied widely from item to item. Perhaps the best figures to take as an indication of the share of the industry in the hands of local authorities are those showing the number of car-miles run, for 75 per cent. of which the Local Authorities were responsible in 1913 and for 83 per cent. in 1925. It will also be seen that, in the case of each item, there were increases in respect of the local authorities' undertakings and decreases in respect of the companies' undertakings, the change being due largely to transfers of ownership. In this connexion, local authorities' right of compulsory purchase of tramways in their area at recurring intervals should be remembered, as many of the local authorities' systems have been acquired from companies in this way. Another point is worth mention. With some important exceptions, e.g. Bristol and Swansea, it is usual for local authorities to operate the tramway systems in the larger towns, while companies chiefly operate in inter-urban areas and the smaller towns. This fact is largely responsible for the percentage of route-miles owned by the local authorities being lower than the percentage attributable to them in respect of the other items dealt with in the above tables.

*Prices and profits.*

It is not possible to give comparable figures of fares charged per mile by municipal and company-owned tramways respectively. The average fare paid per passenger journey was somewhat lower in the case of local authorities' undertakings than in the case of companies' undertakings in both periods, being 1·0 pence as against 1·2 pence in 1913 and 1·4 pence as against 1·6 pence in 1925.

As to profits, the following figures show the revenue account (income from traffic and from miscellaneous sources) and the tramways expenditure (working expenses and rates and taxes, excluding Income Tax, Schedule D), for the two periods :—

		1913.	1925.
Local authorities :—		£	£
Revenue .. ..	11,396,710	23,918,622	
Tramways expenditure ..	7,436,884	19,009,122	
Net receipts .. ..	<u>3,959,826</u>	<u>4,909,500</u>	
Companies :—			
Revenue .. ..	3,763,766	4,292,733	
Tramways expenditure ..	2,342,679	3,589,495	
Net receipts .. ..	<u>1,421,087</u>	<u>703,238</u>	

In the case of the local authorities, therefore, the net receipts rose by 24 per cent., while in the case of companies the net receipts fell by 51 per cent.

The gross receipts, gross working expenditure and net receipts per car-mile in the two periods were :—

		1913.	1925.
		<i>Pence per car-mile.</i>	<i>Pence per car-mile.</i>
Local authorities :—			
Gross receipts .. ..	.. ..	10·69	17·70
Gross working expenditure .. ..	.. ..	6·98	14·07
Net receipts .. ..	.. ..	<u>3·71</u>	<u>3·63</u>
Companies :—			
Gross receipts .. ..	.. ..	10·87	16·13
Gross working expenditure .. ..	.. ..	6·77	13·49
Net receipts .. ..	.. ..	<u>4·10</u>	<u>2·64</u>

The net receipts per car-mile of the local authorities' undertakings, therefore, fell by four-fiftieths of a penny, or 2 per cent., between 1913 and 1925 while those of the companies fell by nearly 1½ pence, or 36 per cent. The net receipts per car-mile of the companies were about two-fifths of a penny above those of the local authorities in 1913, but in 1925 were practically 1 penny less. The cause of this

change is that, while the working expenditure per car-mile almost exactly doubled in respect of each class of undertaking, the gross receipts per car-mile of the local authorities' undertakings rose by 66 per cent., as against a rise of only 48 per cent. in the case of companies' undertakings.

The ratio of net receipts to capital expenditure for the two dates was :—

		1913. Per cent.	1925. Per cent.
Local authorities ..	.. .. .. .. ..	7.29	6.40
Companies ..	.. .. .. .. ..	6.35	3.53

This latter table goes to confirm the conclusion as to the relative prosperity of the two types of undertaking which the previous figures here given suggest, i.e. (a) that, on the average, the local authorities' undertakings are not so prosperous as in 1913, their net receipts having risen by 24 per cent., a figure insufficient to meet the contemporary change in the value of money, their net receipts per car-mile having fallen slightly, and their ratio of net receipts to capital expenditure having, also, fallen slightly; and (b) that on the average the companies are very much less prosperous than in 1913, their net receipts in 1925 being less than half those of 1913, their net receipts per car-mile having fallen by 36 per cent., and their ratio of net receipts to capital expenditure having fallen steeply. No account, it will be observed, is taken of the degree to which the various undertakings are maintained. This cannot readily be ascertained.

#### *Conditions of working*

The general conditions under which tramways or light railways operate are still those laid down by the Acts of 1870 and 1896, to which reference has been made above in describing the history of these undertakings. The differences between the municipal and private enterprises in regard to the raising and repayment of capital exist in regard to tramways as in regard to gas and electricity supply undertakings, i.e., the local authorities raise the capital required for their tramways by loan on the security of the undertaking and provision has to be made for the repayment of the loans.

#### Trackless Trolleys and Omnibuses.

Another form of transport, in the operation of which local authorities are concerned, consists of trackless trolleys. In 1913, 26 such undertakings were authorised for operation, 21 by local authorities

of which 8 only were actually being operated in that year, and 5 by companies of which none had been commenced. By the end of 1925 the number of undertakings authorised had increased to 38, 37 of them being local authorities' undertakings, 18 of which were operated in that year. The remaining undertaking was owned and operated by a company, the powers held in 1913 having lapsed in the case of the other companies. The aggregate capital expenditure on the local authorities' undertakings in 1913 was £62,049, and £528,616 in 1925, in addition to £17,092 on the company system. In 1913 the number of passengers carried was just under 2 million, and rather more than 33½ million in 1925, of whom all but about a million were carried by the local authorities' systems. As to profits, the net receipts of the local authorities' systems were £2,829 in 1913, and £32,427 in 1925, while the company in 1925 made a loss.

Local authorities also operate a number of omnibus services, but information similar to that obtainable in regard to tramways is not available in regard to them. A tramway system or a trackless trolley system, by whomsoever operated, must be authorised by special Act or Order, whereas the operation of omnibuses requires no statutory powers except where the party proposing to operate is a local authority or a statutory company. As a result, large numbers of omnibuses are operated by private persons or non-statutory companies, and no data are available for instituting a comparison between the development and financial results of omnibus services run by local authorities and private enterprise respectively.

#### Conditions of Workpeople employed by Municipal and Private Enterprises.

*Wages.*—Rates of wages in the gas, electricity, and water supply, and in the tramway industry are the subject of decisions of National Joint Industrial Councils, or of recommendations of Area Councils affiliated to the National Councils. Both municipalities and private undertakings are represented on the employers' side of these bodies in each of the industries ; and the agreements arrived at by the Councils are observed by the great majority of the undertakings.\* The arrangements made provide for the allocations of towns to certain grades or zones, the rates of wages for particular occupations being uniform for all towns in the same grade or zone. In the case of gas and electricity supply the grading of towns and the fixing of wages are dealt with by Area Councils, though wage rates are varied periodically by uniform amounts throughout the country by the National Council ; and in the tramway industry the grading of towns

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\* Of the few municipalities and private employers who fix rates of wages independently, some of each class pay wages in excess of those recommended by the Councils, and some pay wages lower than those recommended.

and fixing of wages was made the subject of a decision of a special tribunal appointed by the National Council. The allocation of towns is based on relative importance or on the size of the undertaking. In no case is any differentiation made on the basis of ownership.

*Hours.*—Hours of labour are dealt with in the same way as rates of wages, and, for practical purposes may be said to be uniform throughout the country in each of the industries.\*

*Profit-sharing.*—Profit-sharing may be mentioned here owing to the fact that it is more commonly adopted by gas companies than in any other sphere of industry.†

Local authorities do not practise profit-sharing ; and at the end of 1926 no profit-sharing schemes were being operated by tramway companies, and only three by electricity supply companies ; 46 schemes, however, with 39,000 employees entitled to participate were then being operated by gas companies. The number of persons employed by gas companies was given by the Census of Production of 1924 as about 76,000, so that something like half the employees of the gas companies appear to be entitled to participate under profit-sharing schemes. The average amount of bonus per head in 1926 under these schemes was, approximately, £7 10s., the average addition to earnings being about 4 per cent.

### Summary.

*Extent of municipal and private enterprise.*—The figures given in this chapter indicate that the share of the municipalities in the gas supply industry is slightly less than 40 per cent. of the whole, that their share of the electricity supply industry is about 66 per cent. of the whole, that their share of water supply is just over 80 per cent. of the whole, and that their share of the tramway industry is rather more than 80 per cent. of the whole.

*Growth of municipal and private enterprise.*—The figures given above indicate that the output of gas, roughly, doubled between 1907 and 1924, and that the sales of gas increased by about one-third between 1913 and 1925. The local authorities took their proportionate share of these increases, so that their share of the industry has remained constant over the period. The electricity supply industry has expanded rapidly in recent years, and the available figures indicate that, as in the case of gas supply, the local authorities have taken their proportionate share of the increase. In the case of

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\* Certain classes employed by one gas company, and certain classes employed by one municipal electricity supply undertaking work a little longer than similar employees of other undertakings.

† See "Survey of Industrial Relations," pp. 324-325.

water supply the share of the local authorities was the same in 1924 as in 1907. In the case of tramways the undertakings of the local authorities were more extensive in 1925 than in 1913, while those of the companies contracted during the period. Consequently, the share of the industry held by the local authorities increased noticeably.

*Prices and profits.*—There is no information available for an accurate comparison between the prices charged by municipal and private enterprises respectively; but in regard both to gas and to electricity supply the local authorities are subject to maximum prices, and the gas companies either to maximum prices or to a compulsory sliding scale whereby dividends can only rise as the price falls and electricity supply companies to maximum prices and, in certain cases, to a sliding scale as well.

As to profits, the gross profit of local authorities' gas undertakings per 1,000 cubic feet of gas sold was almost identical in 1913 and 1925, i.e. there was no increase to meet the change in the value of money, while the figure for gas companies shows a decrease of  $\frac{1}{2}$  penny. As to electricity supply undertakings, the average dividend on ordinary shares paid by the companies in 1925 was, approximately,  $9\frac{1}{2}$  per cent., and the number of local authorities' undertakings receiving contributions from the rates had fallen in 1925-26 to 17 out of a total of 358, and the amount received to the very small figure of £18,000. Except in regard to the loss of prosperity by company-owned tramways, there is nothing in the figures given in the foregoing pages to suggest any very material difference in the prices charged to consumers or users or in the general level of prosperity between the two types of undertaking. In regard to tramways, the net receipts of the local authorities' systems increased by 24 per cent., a figure inadequate to meet the change in the value of money and well below the contemporary increase in capital expenditure (41 per cent.). In the case of company tramways, the net receipts fell by 51 per cent., though the capital expenditure involved only decreased by 11 per cent.

*Conditions affecting the working of municipal and private enterprises*—Any comparison of the financial prosperity of the two classes of undertaking is complicated by the fact that the main difference between them is to be found in the method of capitalisation. The capital for the local authorities' undertakings is raised by loans repayable in specified periods, while that of the companies (apart from loans) is held by shareholders in the ordinary way. In the result, the appropriation of the revenue is very dissimilar, since the local authorities have to provide for repayment of loan out of revenue, whereas the companies do not, and the companies have to maintain their assets out of revenue or by depreciation funds, whereas the local authorities can leave replacements to be provided through fresh borrowings when the original loans are discharged.

The other important difference in the working conditions is also financial, and lies in the power of local authorities to call on the local rates to defray deficiencies in the revenue of the undertaking, whether for operating the undertaking or for meeting repayment of loan. In other respects, the conditions of working are not dissimilar. Both local authorities' and companies' electricity supply undertakings are subject to maximum prices, as are local authorities' gas undertakings and about half the statutory gas companies. The other statutory gas companies are subject to control of price and profit by means of the sliding scale system. The position of the two classes does not materially differ in regard to the supply of public lighting or as to the sale of fittings, etc.

In regard to electricity supply (except in the case of the power companies) and tramways, the governing legislation confers powers on the municipalities to purchase private enterprises compulsorily, if they so desire, at fixed recurrent intervals, and this power has been used in these industries. Compulsory powers to purchase gas and water undertakings, however, have to be sought by private Bill and the practice of Parliament as to granting them has varied with individual cases.

*Conditions of employment.*—There is no difference between the rates of wages and hours of labour of persons employed in the gas, electricity, and water supply industries and on the tramways of local authorities and companies respectively, as these are settled by joint bodies on which both classes of undertakings are represented on the employers' sides.

#### DOCK AND HARBOUR ADMINISTRATION,

#### WITH SPECIAL REFERENCE TO ADMINISTRATION BY PUBLIC TRUSTS.

The system under which the docks of some of the most important ports of the country are owned and administered by specially constituted Port Authorities, known as Public Trusts, provides an example of a service essential to the prosperity of industry being carried on by an organization other than the State, the Municipalities, or private enterprise. This system of administration has unique features and the present purpose is to describe the system and to give some particulars of its origin and prevalence, and of the reasons for its adoption and retention.

Until comparatively recent times, all that shipping required of a port was that it should provide shelter from storms and that its situation should be capable of defence against attack. No great depth of water was required and consequently little or no dredging had to be undertaken, while the ships needed no elaborate appliances

for purposes of loading and discharging. Ports, accordingly, existed where natural conditions were suitable and where trade was available, the only limiting factor being the efforts periodically made by governments to confine foreign trade to certain specified places with a view both to its regulation and its control. Until the end of the eighteenth century ports remained, to present ideas, very primitive, the only changes from their natural condition being the provision of small piers and wharves, barges, lights and perhaps a certain amount of dredging and embanking. The control of harbours and waterways vested in the King, and the port facilities provided within those harbours were generally established under the authority of Royal Charters conferring the right to levy dues. Many of these Charters were granted to municipal authorities.

Docks as an essential feature of a port did not make their appearance until about the year 1800. A small dock had been constructed on the Surrey bank of the Thames as early as 1696 and another at Liverpool in 1710, but it was not until the opening of the West India Dock in London in 1802 that dock development really began. The progress of dock construction may be illustrated by the example of London. The opening of the West India Dock was followed by that of the London Dock in 1805, the East India Dock in 1806, the first dock of the Surrey Commercial Dock system in 1807, the St. Katherine Dock in 1828, the Royal Victoria Dock in 1855, the Millwall Dock in 1868, the Royal Albert Dock in 1880, Tilbury Dock in 1886 and the King George V Dock in 1914. This history is typical of the steady progress in dock construction at the chief ports during the nineteenth century. The first half of the century saw big developments in the dock systems of Liverpool, Hull, Southampton, Cardiff and Bristol, while docks were opened at Newcastle in 1857, at Glasgow in 1867, and at Manchester in 1894.

The earlier docks were usually constructed and administered by companies formed for the purpose, this being the case, for example, with the docks of London, Hull, Southampton, Birkenhead and Cardiff. At a later date, the Manchester docks were constructed by the Ship Canal Company. On the other hand, the Liverpool and Bristol docks were built and administered by the Corporations of those cities. About the middle of the nineteenth century, a volume of complaint arose as to the inadequacy of these methods of control to meet the increasing requirements of trade and shipping, and, starting with the case of Liverpool in 1857, Parliament in the latter half of the century passed a number of Acts setting up specially constituted Port Authorities as public undertakings and not with a view to making a profit. These bodies, where constituted, were charged with the administration of various ports and harbours, and were given powers to control and improve the river or harbour, as well as to administer the docks. In other cases, bodies of conservators (e.g. the Thames Conservancy) were created to control the

river and navigation, although the docks and wharves remained in private hands. Another development was occurring more or less contemporaneously with the movement for setting up port authorities. The railway companies, which were becoming progressively larger and more powerful as a result of amalgamation, constructed numerous docks and harbours, and in other cases, as at Hull and Southampton, acquired and extended dock systems constructed by dock companies.

The history of dock construction and development has been very shortly described in order to explain how it arose that, in Great Britain, examples are found of four main forms of control of important ports. These are :—(i) Specially constituted Port Authorities, sometimes known as Public Trusts ; (ii) Municipal Authorities ; (iii) Railway Companies ; and (iv) Dock Companies or private owners. This position contrasts sharply with that of continental ports, in practically all of which the coast line, waterways, docks, and quays belong to and are controlled by the national or local government.

*Recent changes in control.*—Two changes of outstanding importance in port control have been made during the present century. The establishment of the Port of London Authority in 1909 marks, up to date, the last of the series of changes by which the administration of important ports was transferred to public trusts. More recently still, all the dock undertakings of South Wales have been transferred to one control, that of the Great Western Railway. Previous to 1921, the various ports and docks had been under different and separate ownerships, but after the passing of the Railways Act of that year they all came under the control of the Great Western with the exception of Swansea, and by a subsequent arrangement the docks there also passed into the hands of that company. In consequence, there is now a single control over all the ports of the industrial area of South Wales, which previously were in active competition with one another.

*Comparative importance of various forms of control.*—The number of ports in Great Britain, particulars of whose trade are given in the Annual Statement of Trade, is 101 ; but it is unnecessary for the present purpose to examine the control of each of these ports, many of which are small.

The Port Facilities Committee, appointed by the Chamber of Shipping,\* when examining the facilities of the principal ports, visited and reported upon 30 places. At 10 of these the docks are administered by a Public Trust, at 2 by a Municipality, at 14 by a Railway Company, and at 3 by Dock Companies or private owners ; and in the remaining case (Newcastle) there are docks controlled by

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\* See Chapter IV, "Transport Facilities", p. 229.

a Trust, a quay maintained by the Municipality and docks controlled by a Kailway Company. As is explained in the chapter in this volume dealing with "Transport Facilities," there are twelve great ports which together handle between 85 and 90 per cent. of the oversea trade of the country. At five of these the docks are controlled by a public trust, at one by the municipality, at four by a railway company, and at one by a special company, while, as has been stated, there is divided control at Newcastle. These examples suffice to show that, as regards the more important ports, by far the most common methods of dock control are by a public trust or by a railway company and that, counting numerically, these two types of control are about equally common in the important ports.

The comparative positions of these two forms of control, however, are very different if regard is had to the value of the trade passing through the various ports. Among the 30 ports visited by the Port Facilities Committee, the 10 ports where the docks are controlled by a public trust dealt with 67 per cent. of the value of the total imports, exports, and re-exports of Great Britain in 1925, the 14 ports with railway-owned docks dealt with 15 per cent., the two ports with docks controlled by a municipality dealt with 2 per cent., the three ports with company-owned or privately-owned docks dealt with 5 per cent. and Newcastle dealt with 2 per cent. The numerous other ports, over 70 in number, outside this sample, which handled the remaining 9 per cent., contain examples of each of the four forms of control. It seems safe to estimate that at least 70 per cent. of the value of the imports, exports, and re-exports of Great Britain are handled at places where the docks are under the administration of a public trust.

The docks of the two greatest ports of Great Britain, London and Liverpool, are administered by a public trust, as are those of Glasgow, Leith and Dundee and certain of the Newcastle docks. The most important municipal docks are those of Bristol (including Avonmouth and Portishead). The docks of Southampton, Hull, Grimsby and Cardiff, are the most important examples of docks owned and controlled by railway companies, though certain of the Newcastle docks and those of all the South Wales ports are railway-owned. By far the greatest company-owned docks are those of Manchester, constructed and administered by the Manchester Ship Canal Company.

*Composition of Public Trusts.*—The importance of the ports for which public trusts are responsible having been shown, it is necessary to explain the composition and methods of administration of these bodies. The main features are common to all of them and it is sufficient here to refer in detail to three important trusts, the Port of London Authority, the Mersey Docks and Harbour Board, and the Clyde Navigation Trust.

In 1902 the Royal Commission on the Port of London recommended the creation of a single authority for the control and improvement of the port. Eventually the Port of London Act, 1908, established the Port of London Authority and transferred to it as from 31st March, 1909, the powers of the Thames Conservancy below Teddington, certain duties (as to licensing lightermen, etc.) of the Waterman's Company, and, by purchase, the undertakings and powers of the dock companies. The Authority thus became entirely responsible for the docks and the state of the river except that the City Corporation retained the sanitary supervision of shipping, the Metropolitan Police their responsibilities and Trinity House their powers of lighting and buoying. The privately-owned quays, wharves and warehouses remained independent. The Port of London Authority consists of 29 members, 10 appointed, 18 elected, and a Chairman chosen by the Authority. Of the 10 appointed, one is appointed by the Admiralty, two by the Ministry of Transport, four by the London County Council, two by the City Corporation and one by Trinity House. Of the 18 elected members, 17 are elected on a common register by payers of dues on ships and goods, wharfingers and owners of river craft, and one is elected by wharfingers. As to the provision of capital, the Authority was authorised by the Act to create port stock at fixed rates of interest based on the security of the undertaking. Most of this stock was issued to the dock companies in amounts fixed by the Act on the transfer of their properties to the Authority, and the existing stocks of the dock companies were cancelled. Similarly a fixed part of the port stock was substituted for certain stocks of the Thames Conservancy. The revenue of the Authority is derived from a variety of sources, the more important of which are port rates (subject to statutory maxima) on all goods imported or exported either overseas or coastwise, dock dues and river dues on vessels, rents charged for warehousing, charges made for the use of appliances such as cranes and locomotives and dry docks, and charges made for discharging vessels and warehousing goods. Any surplus revenue can be devoted, after payment of expenses and interest on capital, either to the improvement of facilities or to the reduction of dues and charges, as the Authority may decide. The Act, however, provided two important guarantees. Should the Authority default in payment of interest on the port stock the holders may apply to the High Court for the appointment of a receiver; and if the Board of Trade (now the Minister of Transport) were satisfied that the receipts on revenue were or were likely to be insufficient to meet the charges payable out of revenue the Board might order the Authority to increase its dues and charges. These provisions served materially to cheapen the operation of purchase, by enhancing the security and hence the value of the port stock. Another important safeguard was that certain trading interests were given the right to

complain to the Department that the Authority were acting in a manner unfairly oppressive to them. This power has been rarely used, especially in recent years.

Until 1855, the Liverpool docks belonged to the Liverpool Corporation, and those of Birkenhead partly to a body called the Birkenhead Dock Commission and partly to a company. In the year mentioned an agreement was made for the transfer of all the docks at Birkenhead to the Liverpool Corporation. As a result, however, of complaints by industrial interests in Manchester and by the Great Western Railway Company, the matter was considered by a Select Committee of Parliament. In consequence, an Act was passed in the same year creating the Mersey Docks and Harbour Board. To this body were transferred, as from 1st January 1858, all the docks at Liverpool and Birkenhead and all the powers over the port then belonging to the Corporation. The Board consists of 28 members, four being nominated by the Conservancy Commission of the River Mersey (i.e. the First Lord of the Admiralty, the President of the Board of Trade, and the Chancellor of the Duchy of Lancaster), and 24 elected by payers of dues and charges. It will be noticed that the main difference between this membership and that of the Port of London Authority is that, at Liverpool, there is no direct representation of the municipality. As in the case of London, the capital was raised by loans at fixed rate of interest, and the revenue is provided by the dock tonnage and harbour rates, dry dock rates, and dock rent on vessels, and dock rates and "town dues" \* on goods, as well as by charges for the use of appliances. The Board, like the Port of London Authority, is not a body concerned to make money for distribution as profit and it devotes its revenue to the upkeep and improvement of the port. In practice, both the Port of London Authority and the Mersey Docks and Harbour Board have been financially prosperous and both have spent many millions of pounds upon improvements and new construction.

The Clyde Navigation Trust was constituted by an Act of Parliament of 1858. At that time there were no docks at Glasgow, but a great deal of work had been done by the municipality in deepening and widening the channel, which was originally at Glasgow itself only a shallow stream. The first of the Glasgow docks was opened in 1867, and it, like others subsequently constructed, was built and controlled by the Trust. The Clyde Navigation Trust, therefore, differs from the Port of London Authority and the Mersey Docks and Harbour Board in that it did not take over existing docks from another form of management. In composition, also, the Clyde Trust differs from both the London and Liverpool bodies,

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\* "Town dues" are tolls on goods landed and shipped. They originally belonged to the Crown, but were ultimately purchased by the Corporation and transferred to the Board for £1,500,000.

as it includes municipal representatives and commercial representatives (elected by the Chamber of Commerce, the Merchants' House and the Trade House), as well as persons elected by payers of dues.

The other public trusts are composed, broadly, in the same way as those described above, and consist of a mixture of nominated and elected members, the object of the composition being to obtain as members persons conversant with all the important interests concerned with the prosperity and utility of the port. Their object, in all cases, is to be financially self-supporting and in the great majority of cases this has been achieved. In every case, however, there is statutory provision for the appointment of a receiver (usually by the Board of Trade\*) to administer the port if interest charges cannot be met. This power has had to be exercised in regard to certain of the smaller trusts.

It should be mentioned that, with the exception of some of the Fishery and other small harbour authorities, all the port authorities, whether public trusts, municipalities, railway companies, or other companies have had to apply since the war for power to raise their statutory maxima charges in consequence of the increased level of prices and costs. The question of port charges, however, is dealt with in another chapter in this volume.†

*Scope of administrative activities.*—The extent of the responsibilities undertaken and the operations performed by the various authorities differ very widely. The variations in practice are extremely numerous and complicated, but only a brief reference to the question is possible here.

At the ports where the docks are railway-owned, the railway companies own and administer the whole undertaking. This means that they not only own and control the docks, but also employ all, or most of the labour to load or discharge vessels, provide warehousing accommodation, and supply all kinds of handling facilities such as elevators, conveyors, cranes, railway lines, locomotives, wagons etc. The Manchester Ship Canal Company works on similar lines. On the other hand, at Bristol the municipality owns and manages the docks and the harbour generally, and provides various handling facilities, but it leaves in a large measure to ordinary commercial enterprise the employment of labour for loading, discharging, and moving cargoes.

The extent of the activities of the public trusts varies at almost every port. The operations performed by the Port of London Authority, for example, are much more numerous than those performed by the Mersey Docks and Harbour Board. As these two cases may be taken as instances of the two extremes and as they are the two most important of the public trusts, their methods of

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\* These powers have been transferred to the Minister of Transport.

† See Chapter IV, "Transport Facilities", pp. 226-230.

administration may be referred to in some detail for purposes of illustration. The description it should be realised is a short one and port administration is extremely complex. Consequently, there are numerous small deviations of practice beyond the broad differences referred to here.

The Port of London Authority, as explained above, is responsible for the state of the river with the exception of buoying and lighting and of certain sanitary and policing powers. It is, also, entirely responsible for the upkeep and improvement of the docks, for the construction of new docks, and for the fixing, within statutory maxima, of rates and dues. It also provides all the handling facilities at its docks, and owns and controls a number of dry docks. The Authority, however, is something more than a dock-owning undertaking with powers over the river channel. It took over the great range of warehouses which had belonged to the old dock companies and has spent very large sums upon the construction of new sheds, warehouses, and cold storage accommodation. The Authority also performs many operations in connection with the goods stored by it, such as reporting upon weight, quality and condition of commodities, and sorting, inspecting, and furnishing samples of goods. It also delivers imported goods to consignees and undertakes the collection, conveyance and shipment of goods for export. In view of the range of the trade of London, this implies that the Authority directly handles practically all articles of commerce. The Authority, following on the methods of the old dock companies, employs at some of the docks the labour for discharging vessels. The extent of its various activities may be gathered from the numbers of the Authority's employees. The total number employed by it is about 12,000, of whom about 10,000 are engaged in the various dock and warehouse operations. Of the latter number, rather over 5,000 are dock labourers. There are also, of course, numerous private wharfingers, master stevedores, and lightermen and warehouse and granary keepers, as these firms were not transferred to the Authority on its formation ; whilst certain shipowners are direct employers of dock labour.

The Mersey Docks and Harbour Board also includes within its scope the functions relating to the management of the river and the harbour itself, including, unlike the Port of London Authority, the buoying and lighting of the approaches to the port. The Board owns and controls the docks of Liverpool and Birkenhead and has constructed a number of new docks. It also fixes dues within the statutory maxima. It owns and controls a variety of handling appliances, such as cranes and coaling appliances, while, in addition, it owns a number of dry docks and the railway lines and locomotives of the Liverpool Dock Estate. The Board, however, is not a warehousing concern on anything like the scale of the Port of London Authority. The Board does provide a certain amount of warehouse

accommodation, but primarily for wool and tobacco. The bulk of the warehouses and cold storage accommodation and the grain elevators are owned and worked by companies which employ their own men. As a general rule the Board does not employ labour for loading or discharging, except in certain closed docks handling bonded cargoes. The Board, however, through an independent official licensed by the Board and known as the Master Porter, exercises by means of bye-laws a certain control over the rates charged by the private concerns for discharging inward cargoes.

It will be seen from the foregoing account that, broadly speaking, the Mersey Docks and Harbour Board as a dock-owner limits its activities to providing facilities and leaves to ordinary commercial enterprise the utilisation of these facilities, while the Port of London Authority goes a great deal further and not only employs dock labour direct on a large scale but also acts as the biggest warehouse keeper in the port. The widespread nature of the activities of the Port of London Authority is exceptional, and while, as has been stated, the methods and scope of dock administration vary from port to port, the work of no other public trust is comparable with that of London. To mention a few examples, at Glasgow the Clyde Navigation Trust carries out the whole operations of discharge and delivery at the granary (which the Trust owns), but with this exception, does not supply labour for loading and discharging other than the provision of cranemen and capstanmen. At Greenock stevedorage is dealt with by individual firms subject to control by the Trust, but firms make their own quotations irrespective of the Trust. At Leith, the Dock Commission is responsible for the docks and for only part of the facilities and services. At Middlesbrough the Tees Conservancy Commission have no employees engaged in loading and discharging of vessels, the work being done by ordinary commercial enterprise. At Newcastle, the Tyne Improvement Commission provides the various handling facilities at their quays and docks, and also carries out loading and discharging with their own labour. The Dundee Harbour Trust does no loading or discharging, the work being done by ordinary commercial enterprise.

*Efficiency of different forms of control.*—It is not possible to measure the comparative efficiency of the four main forms of control of ports, or even to say with confidence that any one form is always better than another.

If, for instance, regard is had to recent developments and improvements of the docks at different places, it is found that, during the present century, huge works of development have been undertaken in London, Liverpool and Glasgow by public trusts, in Southampton and the South Wales Ports by railway companies, and in Manchester by the Ship Canal Company. These are merely given as prominent examples, and each of these forms of control has developed and improved numerous other ports and harbours.

A comparison of the dues and rates charged, or of the increases of these above pre-war figures, is of little value apart from a parallel comparison of the facilities provided in return. A port with comparatively high rates and dues may, in practice, be a comparatively cheap port as a consequence of geographical convenience or of highly efficient management or of special appliances resulting in quicker despatch and greater care in handling cargoes.

Again, no hard-and-fast conclusion would be revealed by a comparison of the prosperity of the various undertakings. Most of the great public trusts have been prosperous. Taking the examples of London and Liverpool, the Port of London Authority succeeded dock companies whose financial position was very unsatisfactory, but has itself been able not only to run the port efficiently and without loss, but also to spend vast sums on improvements and new construction. The Mersey Docks and Harbour Board has been similarly successful, but, in that case, a highly profitable undertaking was transferred to it from the Liverpool Corporation. On the other hand certain smaller trusts have been unable to meet interest charges and have had to be taken over by a Receiver. Whereas administration by dock companies failed in London, the Ship Canal Company has built and administered a great and prosperous port in Manchester. The Liverpool docks, when owned by the Corporation, were highly remunerative, but the Bristol docks, which are entirely the property of the Corporation, involve a continuing loss which is met by the rates. The ownership of docks, generally speaking, must be presumed to be profitable, at least indirectly, to railway companies, as, if no profit resulted, the railway companies would not be found, as they are, spending money on their existing docks and even acquiring new docks.

Consideration of the prosperity or otherwise of railway-owned docks, however, raises a difficulty which affects all these financial aspects of the question. There is a legal obligation on the railway companies to show the receipts and expenditure of their port undertakings separately and apart from their general accounts. Recently it was contended before the Courts on behalf of the public trusts that in compiling these separate accounts the railway companies had put too narrow a construction on their duties as port authorities and showed only the receipts and expenditure for these narrow duties on the ground that the other services they provided in the ports were rendered as railway companies and not as port authorities. The case went to the Court of Appeal who upheld, generally, the views of the public trusts.

If regard be had to profits, prosperity and other criteria, the facts appear to lead only to the conclusion that, judging from experience, municipal management seems to be the least successful of the four methods at the present time.

As to considerations of a more general nature, the main argument against municipal control was exemplified in the criticisms directed against the administration of the port of Liverpool by the Corporation. The criticisms, broadly, were that the port was administered with too much regard to the local interests of the population of Liverpool and that insufficient attention was given to the wider interests a port should serve, apart altogether from the area in which it is situated. The movement led to the creation of the Mersey Docks and Harbour Board. The criticisms, however, did not end, but continued in Lancashire until the opening of the Manchester Ship Canal in 1894. Nevertheless, the Royal Commission on the Port of London, reporting over forty years after the establishment of the Mersey Docks and Harbour Board, gave as their reason for recommending the creation of a public trust to administer the London docks the public character and success of the various trusts in the United Kingdom and the public administration of foreign ports.

Whatever may be the form of control, the final test of the drawing powers of a port, given adequate facilities geographical and mechanical, is good management. The degree to which competition between ports exists, in a comparatively small country like Great Britain, seems to be sufficient to ensure this. Obviously Welsh coal is unlikely to be shipped from Hull, or Atlantic liners to sail from Leith ; but on the other hand cotton is imported through Liverpool and Manchester, wool through London, Liverpool and Hull, and foodstuffs through London, Liverpool, Bristol, Southampton and Hull, while the industrial areas of the Midlands have a number of equally well-situated ports from which they can export their products.



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